Vol. 934 Number 3

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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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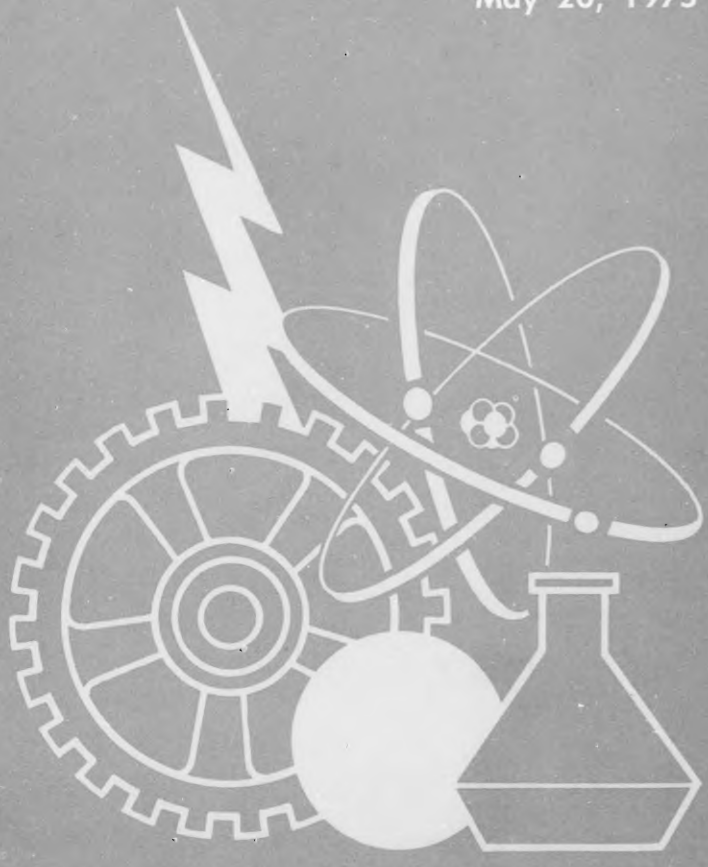

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WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

Apr. 25, 1975.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,826,760, E. G. Rice, COMBINATION STOCKINGS AND PANTY; **Re. 25,360**, same, **filed** Dec. 12, 1974, D.C., W.D.N.C. (Statesville), Doc. ST–C–74–53, *Tights, Inc.* v. *Big Star Food Center.*

2,855,744, W. H. Phelps, FORAMINOUS GRASS CATCHER; **2,983,096**, same, ROTARY CUTTER AND HOUSING STRUCTURE, **filed** June 10, 1974, D.C., W.D. Wis. (Madison), Doc. 74–C–187, *Sensation Corporation* v. *Wisconsin Marine, Inc.*

2,983,096. (See 2,855,744.)

3,028,877, J. W. Thieme, PRESSURE AND FLOW CONTROL VALVE, **filed** Jan. 22, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c185, *Acco International, Inc.* v. *Swingline, Inc.* On stipulation of parties, cause is dismissed, July 23, 1974.

3,032,781, J. A. Constanti, SAFETY SIDE, **filed** Apr. 2, 1963, D.C., S.D.N.Y., Doc. 63–C–933, *Lumex, Inc.* v. *Simmons Company.* Plaintiff's complaint is dismissed without prejudice. The counterclaim of defendant is dismissed without prejudice, July 21, 1965.

3,116,557, J. R. Trice, Jr., METHOD AND MEANS FOR LAYING SEWER PIPE, **filed** Feb. 4, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c335, *Laser Alignment, Inc.* v. *Coherent Radiation, Lee Jensen Sales and Di Paolo Const. Co.*

3,483,716, G. Stenzler, PERSONAL ORNAMENT WITH MOUNTING AND INDEXING MEANS FOR CENTERING VARIED NUMBERS OF JEWEL SETTINGS, **filed** Aug. 11, 1970, D.C., S.D.N.Y., Doc. 70–C–3444, *Transamerica Overseas Ltd.* v. *Zale Corporation.* Stipulation of dismissal, Dec. 31, 1970.

3,487,999, Nash, LaBranche, Newman and Smith, ROADWAY TOY, **filed** Jan. 9, 1970, D.C., S.D.N.Y., Doc. 70–63, *Mattel Inc.* v. *Fred Bronner Corporation.* Filed final judgment on consent restraining and enjoining defendants from directly or indirectly infringing claims one thru nine. Counterclaims are dismissed, Sept. 10, 1973.

3,527,320, A. L. Cunningham, EXTENDABLE SHORING SCAFFOLD, **filed** Mar. 12, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV 74–648–DWW, *The Ceco Corporation* v. *Bliss & Laughlin Industries.*

3,541,606, Heenan and Nagel, REFLECTORIZED VEHICLES AND REFLECTORS THEREFOR, **filed** Aug. 2, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c2192, *Amerace Corporation* v. *Safe-Lite Mfg. Co. et al.*

3,553,737, J. Bauman, METHOD OF APPLYING HAIR, **filed** Aug. 2, 1974, D.C., N.D. Calif. (San Francisco), Doc. C–74–1628RFP, *Dura-Hair International, Inc. and Ultra Hair Center, Inc.* v. *Hair Forever Centers of San Francisco, Inc.*

3,563,088, L. R. Sperberg, NON-DESTRUCTIVE METHOD OF DETERMINING TIRE LIFE, **filed** Oct. 5, 1972, D.C., N.D. Ohio (Cleveland), Doc. C72–1067, *Lawrence R. Sperberg* v. *Firestone Tire and Rubber Co. et al.* Jury Trial, Verdict for the defendant, order that the complaint is hereby dismissed at plaintiff's costs, Apr. 30, 1974. **Same, filed** July 30, 1973, D.C., N.D. Ohio (Cleveland), Doc. C73–801, *Lawrence R. Sperberg* v. *The Goodycar Tire & Rubber Company.* Jury trial, verdict for the defendant, order that the complaint is hereby dismissed at plaintiff's costs, Apr. 25, 1974. **Same, filed** July 30, 1973, D.C., N.D. Ohio (Cleveland), Doc. C73–802, *Lawrence R. Sperberg* v. *The Firestone Tire & Rubber Co.* Jury trial, verdict for the defendant, order that the complaint is dismissed at plaintiff's costs, Apr. 30, 1974. **Same, filed** July 30, 1973, D.C., N.D. Ohio (Cleveland), Doc. C73–803, *Lawrence R. Sperberg* v. *The General Tire & Rubber Co.* Jury trial, verdict for the defendant, order that the complaint is hereby dismissed at plaintiff's costs, Apr. 30, 1974. **Same filed** July 30, 1973, D.C., N.D. Ohio (Cleveland), Doc. C73–804, *Lawrence R. Sperberg,* v. *B. F. Goodrich Co.* Jury trial, verdict for the defendant, order that the complaint is hereby dismissed at plaintiff's costs, Apr. 30, 1974.

3,563,851, Armour, Goldberg and Jasinski, WATER RESISTANT VINYL ACETATE COPOLYMER ADHESIVE COMPOSITIONS, **filed** July 15, 1974, D.C., E.D. Pa. (Philadelphia), Doc. 74–1785, *National Casin Company* v. *National Starch and Chemical Corporation.*

3,575,678, W. F. Barton, REED SWITCH ASSEMBLY, **filed** Aug. 9, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2033, *Grigsby Barton, Inc.* v. *M. John Petersen, doing business as M. J. Petersen & Associates.* Enter order by stipulation that cause be dismissed with prejudice, Dec. 14, 1973.

3,586,624, G. P. Larson, WASTE DISPOSAL METHOD AND SYSTEM, **filed** May 20, 1974, D.C., E.D. Pa. (Philadelphia), Doc. CA–73–1726, *Commonwealth of Pennsylvania and Western Berks Refuse Authority* v. *Warner Company.* Stipulation and consent judgment dismissing this action with prejudice, May 22, 1974.

3,592,256, S. H. Knight, CURTAIN CONSTRUCTION, **filed** July 25, 1974, D.C., E.D. Pa. (Philadelphia), Doc. 74–1905, *Hanes-Ivy Manufacturing, Inc.* v. *Economics Laboratory Manufacturing Co.*

3,670,689, M. Pappas, TILT-OPERATED HAND HELD GAS POWERED ACOUSTIC DEVICE, **filed** June 28, 1972, D.C., S.D.N.Y., Doc. 72–C–2756, *Falcon Safety Products Inc.* v. *Midway Radio & Television Corp.* Filed dismissal pursuant to 41(a)(1), May 7, 1973.

3,679,006, A. R. Richmond, POWER TRAIN FOR HORIZONTAL EARTH BORING MACHINE, **filed** Sept. 10, 1974, D.C., N.D. Ohio (Cleveland), Doc. C74–815, *The Richmond Manufacturing Company* v. *American Augers, Inc. et al.*

3,691,972, L. D. Bylund, ALUMINOUS METAL ARTICLES AND METHOD; **3,814,590**, same, ALUMINOUS METAL ARTICLES AND ALUMINUM BASE ALLOYS, **filed** Aug. 8, 1974, D.C., N.D. Ind. (South Bend), Doc. S74–172, *Reynolds Metals Company* v. *Aluminum Company of America and National Can Corporation.*

3,700,792, Harrison III, Honey and Tajchman, COMPUTER ANIMATION GENERATING SYSTEM, **filed** Aug. 20, 1974, D.C., S.D.N.Y., Doc. 74–C–3603, *Computer Image Corp.* v. *Rutt Instruments Corp. and Rutt/Etra Video Systems, Inc.*

3,701,544, F. M. Stankovich, MOTORCYCLE FRONT END ASSEMBLY, **filed** Mar. 1, 1973, D.C., C.D. Calif. (Los Angeles), Doc. 73–453–IH, *Frank M. Stankovich* v. *Cheat-ah Engineering Inc., Randolph L. Rhone & Russell L. Rhone, doing business R. L. R. Cycle Specialties.* Filed consent judgment and order thereon enjoining defendant from infringing plaintiff's patent. Plaintiff waives all past damages and profits, entered June 1, 1973. **Same, filed** Mar. 5, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c569, *Frank M. Stankovich* v. *Warshawsky and Co.* By agreement suit dismissed without prejudice and without costs, May 24, 1973. **Same, filed** Mar. 16, 1973, D.C., C.D. Calif. (Los Angeles), Doc. 73–567–R, *Frank M. Stankovich* v. *Randolph L. Rhone & Russell Rhone, doing business as R.L.R. Cycle Specialties.* Filed consent judgment and order thereon enjoining defendants from infringing plaintiff's patent, entered Apr. 27, 1973.

3,719,389, Burton and Kiger, THERMOPLASTIC TUBING FURNITURE, **filed** July 11, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–1964–F, *Terra Furniture* v. *Grant Electric Company et al.*

3,727,321, Waters and Liedtke, PORTABLE HAIR DRYER, **filed** May 10, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c1203, *Sunbeam Corporation* v. *The Gillette Company.* On motion plaintiff, cause removed from status call of May 1, 1974. Voluntary dismissal without prejudice under Rule 41(a)(1)(i), Apr. 30, 1974.

3,736,197, Messerschmidt, Heyman and Johnsen II, POWDERLESS ETCHING BATH COMPOSITIONS AND ADDITIVES, **filed** May 29, 1973, D.C.N.J. (Newark), Doc. C–752–73, *Philip A. Hunt Chemical Corporation* v. *Mona Industries, Inc.* Stipulation and order of dismissal of action, Feb. 5, 1974.

3,743,280, D. G. Martinez, EXERCISING DEVICE, **filed** Aug. 5, 1974, D.C.N.J. (Trenton), Doc. C–74–1189, *Rainbow Lifeguard Products, Inc., etc. et al.* v. *General Home Products Corporation, etc.*

3,752,533, E. S. Gilbert, UPHOLSTERED SEAT, **filed** Nov. 14, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2898, *Evalin S. Gilbert* v. *Larry Kroll, doing business as Larry Kroll & Co. et al.* By agreement defendants, Larry Kroll, doing business as Larry Kroll & Co. and D-Zion Manufacturers, Inc., dismissed without prejudice. Filed counterclaims by "Today" in Furniture Inc. and Montgomery Ward & Co., Incorporated, Jan. 4, 1974. By agreement, order complaint and counterclaims dismissed with prejudice, Oct. 23, 1974.

3,757,194, Weber and Pugh, CORDLESS POWER TOOL HAVING REMOVABLE BATTERY PACK, **filed** Oct. 3, 1973, D.C., N.D. Ga. (Atlanta), Doc. C.A. 19090, *The Black & Decker Manufacturing Company* v. *Disston, Inc.*

3,771,724, Rose, Kelley and Ravitts, APPARATUS AND PROCESS FOR SPRAYING LIQUIDS, **filed** May 8, 1974, D.C., N.D. Ill. (Freeport), Doc. 74–31, *Richards of Rockford, Inc.* v. *Aqua-Aerobic Systems, Inc.*

3,772,241, C. H. Kroekel, UNSATURATED POLYESTER RESINOUS COMPOSITIONS, **filed** Nov. 13, 1973, D.C., N.D. Ala. (Birmingham), Doc. CA 73–L–1080–Ne, *Rohm and Haas Company* v. *Owens-Corning Fiberglas Corporation.*

3,775,775, A. Mazzenga, DESIGN CODING FOR COORDINATED GARMENT SETS, **filed** Sept. 25, 1974, D.C., M.D.N.C. (Greensboro), Doc. C–74–306–G, *Garan, Incorporated* v. *Blue Bell, Inc.*

3,775,951, Eicholz and McCambridge, VACUUM CLEANER, **filed** Feb. 19, 1974, D.C. Conn. (Bridgeport), Doc. B–74–54, *Shelton Products, Inc.* v. *Central Quality Industries, Inc.*

3,778,852, Penn, Penn and Roughley, WATER BED, **filed** June 24, 1974, D.C., N.D. Calif. (San Francisco), Doc. C–74–1323 RHS, *Penn International Industries, Inc.* v. *The Pennington Corp. et al.*

3,814,590. (See 3,691,972.)

Re. 25,360. (See 2,826,760.)

Re. 25,695, Cook and Farnam, EXPLOSIVE COMPOSITION COMPRISING AMMONIUM NITRATE AND HEAT-PRODUCING METAL, **filed** July 15, 1969, D.C. Utah (Salt Lake City), Doc. C249–69, *Iron Ore Company of Canada and Ireco Chemicals* v. *Dow Chemical Co., etc. et al.* Patent held invalid as to each and every claim and unenforceable against Dow Chemical Co. by reason of Dow's intervening rights; Ireco Chemicals held owner of whatever rights may remain in reissue patent, Apr. 5, 1973.

D. 206,199, B. Zuckerman, GARMENT HANGER, **filed** July 10, 1968, D.C., S.D.N.Y., Doc. 68–C–2806, *Mr. Hanger, Inc.* v. *Warbern Plastics, Inc.* Filed consent judgment that defendant is hereby perpetually restrained and enjoined etc., Feb. 3, 1970.

D. 209,029, McFadyen and Macowski, TELEPHONE INDEX OR THE LIKE, **filed** Oct. 30, 1970, D.C., S.D.N.Y., Doc. 70–C–4781, *Ketcham & McDougall, Inc.* v. *Carl Mfg. Co. Ltd. of Japan.* Filed stipulation and order that this action is hereby dismissed without prejudice, May 15, 1973.

D. 227,091, Grove and Shockey, MOBIL AERIAL WORK PLATFORM, **filed** Nov. 9, 1973, D.C., C.D. Calif. (Los Angeles), Doc. 73–2626–DWW. *Fulton Industries, Inc.* v. *Calavar Corp.*

D. 233,539, E. J. Echterling, DOG FIGURE TOY BALL, **filed** May 1, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c1129, *ATI Recreation, Inc.* v. *Armac Enterprises, Inc.* Final judgment, cause dismissed, Aug. 28, 1972.

Erratum

Under Patent Suits in the OFFICIAL GAZETTE of July 9, 1974, volume 924, page 162, in the paragraph beginning with 3,370,890, "Reg. No. 866,987" should be deleted. Also cross reference "Reg. No. 866,987 (See 3,370,890)" should be deleted.

Certificates of Correction for the Week of May 20, 1975

3,522,223	3,846,312	3,862,779	3,869,437
3,641,641	3,847,221	3,862,895	3,869,453
3,703,351	3,847,224	3,862,898	3,869,478
3,706,422	3,847,375	3,862,939	3,869,596
3,707,401	3,848,208	3,863,079	3,869,764
3,742,186	3,848,767	3,863,356	3,870,060
3,745,179	3,849,106	3,863,507	3,870,235
3,747,821	3,850,769	3,863,707	3,870,434
3,755,510	3,851,339	3,863,757	3,870,442
3,770,109	3,852,451	3,863,956	3,870,525
3,772,272	3,852,879	3,864,230	3,870,590
3,772,683	3,853,347	3,864,530	3,870,591
3,775,665	3,853,378	3,864,592	3,870,614
3,784,375	3,853,404	3,864,615	3,870,630
3,785,964	3,853,439	3,864,862	3,870,816
3,789,203	3,853,962	3,864,969	3,871,071
3,792,403	3,854,676	3,864,995	3,871,127
3,793,342	3,855,166	3,865,175	3,871,435
3,793,360	3,856,611	3,865,195	3,871,595
3,793,453	3,856,736	3,865,210	3,871,745
3,802,532	3,856,782	3,865,665	3,871,967
3,803,121	3,857,033	3,865,773	3,872,053
3,809,775	3,857,059	3,865,966	3,872,197
3,819,214	3,857,303	3,866,001	3,872,455
3,820,314	3,857,496	3,866,171	3,872,746
3,821,014	3,858,113	3,866,180	3,872,844
3,824,523	3,858,364	3,866,569	3,872,913
3,824,597	3,858,462	3,866,658	3,873,157
3,833,440	3,858,751	3,866,679	3,873,340
3,833,767	3,859,688	3,867,191	3,873,348
3,836,969	3,860,050	3,867,659	3,873,359
3,838,315	3,860,073	3,867,845	3,873,552
3,838,595	3,860,556	3,867,897	3,875,710
3,838,764	3,861,033	3,867,949	3,873,882
3,838,905	3,861,422	3,868,258	3,873,974
3,839,353	3,861,746	3,868,438	3,874,439
3,841,157	3,861,816	3,868,472	3,874,466
3,841,756	3,861,821	3,868,568	3,874,596
3,843,574	3,861,905	3,868,600	3,874,898
3,843,823	3,862,002	3,868,807	3,875,365
3,845,043	3,862,255	3,868,833	
3,845,112	3,862,370	3,868,914	
3,845,364	3,862,518	3,869,302	

Disclaimers and Dedications

3,730,286.—*Peter D. Weiner*, Bryan, Tex. APPARATUS FOR IMPROVING ROTARY DRILLING OPERATIONS. Patent dated May 1, 1973. Disclaimer and dedication filed June 27, 1974, by the assignee, *Esso Production Research Company*.

Hereby disclaims and dedicates to the Public the remaining term of said patent.

3,792,948.—*James A. Martinez*, Pico Rivera, Calif. AUTOMATIC DOUGH ROLLING APPARATUS. Patent dated Feb. 19, 1974. Disclaimer and dedication filed Oct. 7, 1974, by the inventor.

Hereby disclaims and dedicates to the Public claims 1–5 of said patent.

Dedications

3,272,565.—*Richard L. Wilson*, Trafford, Pa. RAILWAY FLUID PRESSURE BRAKE APPARATUS. Patent dated Sept. 13, 1966. Dedication filed Nov. 27, 1974, by the assignee, *Westinghouse Air Brake Company*.

Hereby dedicates to the Public the entire term of said patent.

3,454,100.—*Melvin R. Lilley*, Prince George County, Va. WINDROWING FORK ARRANGEMENT FOR PEANUT DIGGER. Patent dated July 8, 1969. Dedication filed Jan. 14, 1974, by the assignee, *Ferguson Manufacturing Company*.

Hereby dedicates to the Public the remaining term of said patent.

Disclaimers

3,266,008.—*Howard A. Elliott*, Detroit, Mich. ELECTRICAL TERMINAL AND METHOD OF APPLYING SAME TO CONDUCTORS. Patent dated Aug. 9, 1966. Disclaimer filed June 20, 1974, by the assignee, *Essex International, Inc.*

Hereby enters this disclaimer to claim 2 of said patent.

3,301,488.—*Edward O. Norris*, Westport, Conn. SPRAY GUN. Patent dated Jan. 31, 1967. Disclaimer filed Mar. 22, 1974, by the assignee, *The Gyromat Corporation*.

Hereby enters this disclaimer to claims 8 and 9 of said patent.

3,305,690.—*Edward Emanuel Sheldon*, New York, N.Y. ELECTRON DISCHARGE DEVICE WITH FIBER OPTIC END WALL. Patent dated Feb. 21, 1967. Disclaimer filed Aug. 13, 1973, by the inventor.

Hereby disclaims the term of this patent subsequent to Mar. 27, 1978.

3,328,588.—*Samuel B. Steinberg*, Baltimore, Md. APPARATUS FOR MEASURING THE EFFICACY OF AN AIR FILTER. Patent dated June 27, 1967. Disclaimer filed Nov. 19, 1974, by the assignee, *Air Techniques, Inc.*

Hereby enters this disclaimer to claims 1–7 of said patent.

3,453,504.—*James B. Compton*, Campbell, and *Frederick L. Zieber*, Mountain View, Calif. UNIPOLAR TRANSISTOR. Patent dated July 1, 1969. Disclaimer filed May 4, 1971, by the assignee, *Siliconix, Inc.*

Hereby enters this disclaimer to claims 1, 2, 6, 7, 8, 9 and 10 of said patent.

3,465,480.—*Elmer P. Hausermann*, Bensenville, Ill. APPARATUS FOR SHAPING ELECTRODES. Patent dated Sept. 9, 1969. Disclaimer filed June 10, 1971, by the inventor.

Hereby enters this disclaimer to claims 1, 2, 3 and 5 of said patent.

3,473,876.—*Samuel B. Steinber*, Baltimore, Md. PORTABLE FILTER EVALUATION DEVICE. Patent dated Oct. 21, 1969. Disclaimer filed Nov. 19, 1974, by the inventor.

Hereby enters this disclaimer to all claims of said patent.

3,486,495.—*Holless W. Allen*, Kansas City, Mo. ARCHERY BOW WITH DRAW FORCE MULTIPLYING ATTACHMENTS. Patent dated Dec. 30, 1969. Disclaimer filed June 18, 1974, by the assignee, *Allen Archery, Inc.*

Hereby enters this disclaimer to claims 1, 2 and 11 of said patent.

3,496,135.—*Stanley W. Caywood, Jr.*, Wilmington, Del. CRUDE EPDM COPOLYMER STABILIZED WITH A LEWIS BASE. Patent dated Feb. 17, 1970. Disclaimer filed Sept. 1, 1972, by the assignee, *E. I. du Pont de Nemours and Company*.

Hereby enters this disclaimer to claims 1–9 of said patent.

3,507,353.—*Earl F. Murphy*, Florence, Ala. NOISE ATTENUATING MEANS FOR THE DISCHARGE OF A COMPRESSOR. Patent dated Apr. 21, 1970. Disclaimer filed Jan. 31, 1975, by the assignee, *Americold Compressor Corporation*.

Hereby disclaims all the remaining portion of the term of the patent subsequent to Dec. 31, 1974.

3,642,197.—*Donald E. Bean, James T. Engh, James R. Hammer,* and *John J. Igel,* Rochester, *Myron D. Schettl,* Oronoco, *Harry J. Tashjian* and *Richard J. Ullmer,* Rochester, and *John W. Kerr,* Byron, Minn. DATA RECORDER AND VERIFIER. Patent dated Feb. 15, 1972. Disclaimer filed July 1, 1974, by the assignee, *International Business Machines Corporation.*

Hereby enters this disclaimer to claims 1 through 7 of said patent.

3,703,021.—*Allen W. Sharp.* Ottumwa, Iowa. POULTRY PROCESSING METHOD AND APPARATUS. Patent dated Nov. 21, 1972. Disclaimer filed Feb. 12, 1975, by the inventor.

Hereby enters this disclaimer to claims 1, 2, 3, 4 and 6 of said patent.

3,775,797.—*Jacob S. Kamborian,* deceased, late of Newton, Mass., by Lisbeth N. Godley, Washington, D.C., by Michael M. Becka, Watertown, Mass., by Jacob S. Kamborian, Jr., Lincoln, Mass., executors, and *Costa Caris,* East Walpole, Mass. METHOD AND MACHINE FOR LASTING. Patent dated Dec. 4, 1973, by the assignee, *The estate of Jacob S. Kamborian,* deceased.

Hereby enters this disclaimer to claims 48 through 50, 53, 54, 57, 58, 61 and 62 of said patent.

3,805,175.—*Ernie George Nassimbene,* San Jose, Calif. RETROSPECTIVE PULSE MODULATION DECODING METHOD AND APPARATUS. Patent dated Apr. 16, 1974. Disclaimer filed Jan. 17, 1975, by the assignee, *International Business Machines Corporation.*

Hereby enters this disclaimer to claims 1, 2, 3 and 8 of said patent.

3,828,321.—*John A. Wilber,* Elk Grove Village, *Verner K. Rice,* Wheaton, *Rolfe E. Buhrke,* La Grange Park, and *Donald L. Schulte,* Oak Park, Ill. SYSTEM FOR RECONFIGURING CENTRAL PROCESSOR AND INSTRUCTION STORAGE COMBINATION. Patent dated Aug. 6, 1974. Disclaimer filed Mar. 17, 1975, by the assignee, *GTE Automatic Electric Laboratories Incorporated.*

Hereby enters this disclaimer to claims 1, 4, 5 and 6 of said patent.

3,835,312.—*John A. Wilber,* Elk Grove Village, *Verner K. Rice,* Wheaton, *Rolfe E. Buhrke,* La Grange Park, and *Donald L. Schulte,* Oak Park, Ill. RECOVERY CONTROL CIRCUIT FOR CENTRAL PROCESSOR OF DIGITAL COMMUNICATION SYSTEM. Patent dated Sept. 10, 1974. Disclaimer filed Mar. 17, 1975, by the assignee, *GTE Automatic Electric Laboratories Incorporated.*

Hereby enters this disclaimer to claims 1, 3, 4, 6, 8 and 15 of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 26, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-10-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-22-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-14-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-3-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	6-7-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	10-15-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-23-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-23-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-1-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-3-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-24-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-5-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	8-23-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-12-74
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	7-24-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-4-74

Expiration of patents: The patents within the range of numbers indicated below expire during May 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,832,959, to 2,836,825 inclusive
Plant Patents..... Numbers 1,698, to 1,713 inclusive

REISSUE PATENTS

GRANTED MAY 20, 1975

ERRATA

For CLASS	See PATENT NO.
235-153	28,421
324-065	28,422
180-005	28,423
152-330	28,424
085-013	28,427

REISSUES

MAY 20, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

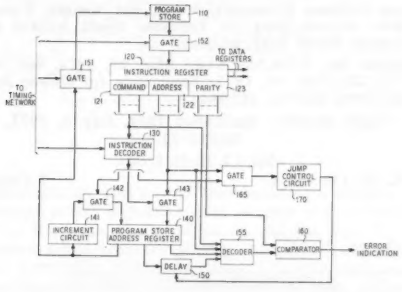
28,421

MEMORY CODING TECHNIQUE

David Michael Rouse, Columbus, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,719,815, dated Mar. 6, 1973, Ser. No. 166,130, July 26, 1971. Application for reissue May 2, 1974, Ser. No. 466,380

Int. Cl. G06f *11/00*; G11c *29/00*
U.S. Cl. 235—153 AM 8 Claims



1. In a system having a memory for storing a plurality of program and data words, apparatus *responsive to signals from said memory for storing* for detecting an error in the content or sequencing of a plurality of said words accessed from said memory comprising:

(A) means for generating for [each] *a given* word stored in said memory a first code word representative of the information content of [that] *said given* word, and of the location at which [that] *said given* word is stored in said memory and of the location of a *different* word desired to be accessed in accordance with a predetermined ordered relationship to [that] *said given* word,

(B) means for storing said first code words,

(C) means for retrieving the code word associated with a given program or data word upon the accessing of said given word,

(D) means for generating for the program or data word most recently accessed from said memory a second code word representative of the information content of [that] *said most recently accessed* word, and of the location from which [that] *said most recently accessed* word was accessed, and of the location from which a word bearing said predetermined ordered relationship to said most recently accessed word was accessed, and

(E) means for generating an error signal whenever the first and second code words associated with an accessed word do not bear a predetermined relationship to each other.

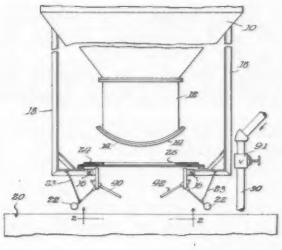
28,422

MOISTURE MEASURING AND TOTALIZING SYSTEM

Paul M. MacKinney, Wheaton, Ill., assignor to Concrete Controls Corp.

Original No. 3,631,337, dated Dec. 28, 1971, Ser. No. 834,036, June 17, 1969. Application for reissue Aug. 17, 1973, Ser. No. 389,230

Int. Cl. G01r *27/02*
U.S. Cl. 324—65 R 9 Claims



8. A system for measuring and totalizing the moisture entrained in aggregate material discharged from a storage vessel to permit said entrained moisture to be compensated for when the aggregate is mixed with water comprising:

a plurality of electrical probes arranged in an array which positions said probes for projection into a plurality of portions of a moving aggregate stream discharged from said vessel;

means for mounting said probes so that the aggregate in said vessel flows in a stream over said probes;

electrical circuit means including an energy source connected to said probes and creating an electrical reference signal which varies in amplitude proportional to the conductivity and hence the entrained moisture content of the stream of aggregate flowing past probes in each of said portions of said stream;

signal-accumulating means comprising a variable speed electrical servomotor which is quickly responsive to said variations in amplitude of said reference signal to proportionately vary the output speed of a motor shaft, said servomotor being connected to said circuit means to produce output revolutions of said motor shaft proportional to both the time interval of aggregate flow and to said signal variations produced by the variations in electrical conductivity of said flowing aggregate stream as sensed by said probes, so that the revolution of said motor shaft is thereby proportional to the total entrained moisture in the quantity of aggregate flowing past said probes; and

means activated by said motor to provide a signal representative of the total entrained moisture in the aggregate discharged from said vessel during said time interval.

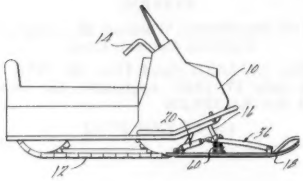
28,423
SNOW VEHICLE FRONT SUSPENSION

William W. Higginbotham, Monroe, Mich., assignor to Monroe Auto Equipment Company, Monroe, Mich.

Original No. 3,623,564, dated Nov. 30, 1971, Ser. No. 872,992, Oct. 31, 1969. Application for reissue Nov. 24, 1972, Ser. No. 309,607

Int. Cl. B62b *17/04*; B62m *27/02*

U.S. Cl. 180—5 R 9 Claims



13. A mounting assembly for operatively mounting a steerable ski on a downwardly directed steering shaft, spindle, or the like of a snow vehicle,

said assembly including an elongated arm disposed above and extending generally longitudinally of the ski,

a hydraulic, direct acting telescopic shock absorber including a cylinder member, a piston rod member reciprocable relative to said cylinder member, first attachment means on one of said members and second attachment means on the other of said members,

a first pivot mounting for connecting one end of said arm to the ski,

a second pivot mounting for connecting the opposite end of said arm to one of said attachment means of said shock absorber, the other of said attachment means of said shock absorber being connected to the ski, and

a helical coil spring having upper and lower end portions and adapted to resiliently resist relative pivotal movement between said arm and the ski,

said lower end of said spring terminating adjacent the ski and said upper end of said spring terminating adjacent said second pivot mounting.

28,424
ELASTOMERIC ARTICLES FREE FROM REINFORCING ELEMENTS

Daniel R. McGillvary, Jackson Township, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Original No. 3,701,374, dated Oct. 31, 1972, Ser. No. 52,150, July 6, 1970. Application for reissue July 17, 1974, Ser. No. 489,304

Int. Cl. B60c *5/00*; C08g *22/04*

U.S. Cl. 152—330 R 11 Claims

1. A tire [1.] a portion at least of the walls of which [A.] are without reinforcing fabric and [B.] are constituted of [1.] a vulcanized elastomer having

[a.] (*a*) tensile strength at 212° F ------p.s.i-- ≥1800

[b.] (*b*) crescent tear strength at 212° F --p.s.i-- ≥200

[c.] (*c*) De Mattia Flex life at 176° F.

cycles-- ≥[2×10⁶] 2×10^5

and at ambient temperature

[d.] (*d*) Modulus of elongation of *at least about*
250[–400] p.s.i. at 5% elongation
[1100–1300 p.s.i. at 100% elongation
1400–1550 p.s.i. at 200% elongation
1600–1800 p.s.i. at 300% elongation
2000–2200 p.s.i. at 400% elongation
2800–3500 p.s.i. at 500% elongation]

[e.] (*e*) Tensile strength—≥2800 p.s.i.

[f.] (*f*) Elongation—≥400 p.s.i.

and

[g.] (*g*) Young's flexural modulus *of no more than about* [10,000–]15,000 p.s.i.

the vulcanized elastomer more particularly having

[h.] (*h*) a molecular weight of 800–5000 between electrostatic cross-links

and

[i.] (*i*) a molecular weight of 5100–40,000 between covalent cross-links.

28,425
OIL FILLED ELECTRIC SUBMARINE CABLE WITH OIL DUCT RESTRICTORS

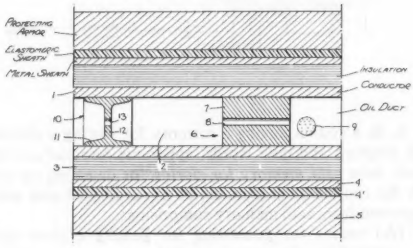
Paolo Gazzana Priaroggia, Milan, and Antonio Ferrentino, Monza, Italy, by Industrie Pirelli Societa per Azioni, Milan, Italy, assignee

Original No. 3,798,345, dated Mar. 19, 1974, Ser. No. 371,123, June 18, 1973. Application for reissue June 28, 1974, Ser. No. 483,956

Claims priority, application Italy, July 3, 1972, 26,535/72

Int. Cl. H01b *9/06*

U.S. Cl. 174—15 C 7 Claims



1. In an electric cable having a duct for the flow of an insulating fluid, the combinatio- therewith of a plurality of restrictors in said duct, said restrictors being [disposed in] spaced [relation] with respect to each other longitudinally of said duct *by a distance of at least about 200 meters* and each of said restrictors comprises a wall extending across said duct and preventing the flow of fluid along said duct but having a hole therethrough of a size which permits the flow of said insulating fluid therethrough but prevents the flow of water drops therethrough.

28,426
SIGNAL COMPRESSORS AND EXPANDERS

Ray Milton Dolby, London, England, assignor to Dolby Laboratories, Inc., New York, N.Y.

Original No. 3,631,365, dated Dec. 28, 1971, Ser. No. 867,454, Oct. 20, 1969. Application for reissue Dec. 27, 1973, Ser. No. 428,914

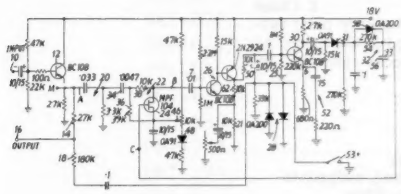
Claims priority, application Great Britain, July 21, 1967, 36,466/69; Nov. 1, 1968, 51,985/68

Int. Cl. H03q *7/06*; H04b *3/04*

U.S. Cl. 333—14 45 Claims

1. A signal processing system for producing an output signal in response to an input signal comprising a main sig-

nal path responsive to said input signal and including means for providing in a specified frequency band extending between first and second limits a first signal substantially proportional to said input signal, a further signal path coupled to said main signal path and responsive to a signal derived from said main signal path for producing a second signal in said specified frequency band, and signal combining means for combining said first and second signals to produce said output signal, said further signal path including a first filter having fixed value components for providing pass characteristics in a fixed band extending from said first limit to a cutoff frequency intermediate said first limit and said second limit; and means for limiting the amplitude of the output signal of the further signal path, said means including a second filter connected in cascade with said first filter and having variable cutoff



characteristics, said second filter including a variable impedance means responsive to an increase in the amplitude of at least one of the output of and the input to said further signal path for altering said cutoff characteristics from wide band pass under very low input signal conditions to progressively narrower band pass, providing a cutoff frequency which shifts away from said second limit sufficiently to attenuate, in combination with the said characteristics of said first filter, any high-level input signal components at any given frequency in said specified frequency band to a specified level corresponding in said second signal to a small fractional part of the maximum level of said input signal, while permitting input signal components below said specified level at frequencies nearer to said first limit then said given frequency to pass through said filters and to appear in said second signal with a lesser degree of attenuation.

28,427

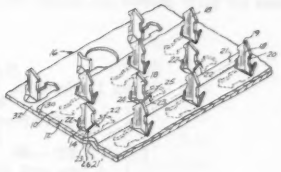
REINFORCING GUSSET PLATE

Donald C. Menge, Warren, Mich., assignor to Troy Steel Corporation, Troy, Mich.

Original No. 3,417,652, dated Dec. 24, 1968, Ser. No. 604,422, Dec. 23, 1966. Application for reissue July 22, 1969, Ser. No. 848,762

Int. Cl. A43b *23/20;* **F16b** *15/00*

U.S. Cl. 85—13 **10 Claims**



1. In combination with a flat nailing plate provided with a plurality of teeth struck out of the plate and unidirectionally projecting therefrom substantially normally to said plate and adapted to be driven into wood members, a reinforcing gusset plate having a plurality of apertures each of which correspond to one of said teeth, said teeth and said apertures being uniformly distributed over said plates with corresponding ones of said teeth and said apertures being located adjacent at least two of the side edges of said gusset plate, said teeth being V-shaped in cross section, said apertures having a straight edge, the ends of which are connected by a curved edge, so that upon said teeth being inserted through said apertures and into said wood members the axis of each tooth is substantially parallel to planes containing said straight edges and the lateral side edges of each tooth are substantially perpendicular thereto, the distance between the sides of the tooth and the edges of said apertures varies in a direction toward the apex of the V-shaped tooth, said gusset plate having teeth members formed in pairs along said curved edges of said apertures in said gusset plate, said teeth members being spaced from each other by said straight edge of said apertures and by a portion of said curved edge, said teeth members adapted to extend into said wood members with the spaces between said teeth members and between said teeth on said nailing plate providing an area for receiving portions of said wood members displaced by said teeth and said teeth members.

PLANT PATENTS

GRANTED MAY 20, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,720
RASPBERRY PLANT
John L. Franklin, Urbana, Ill., assignor to Herschel L. Boll, Champaign, Ill.
Filed Nov. 19, 1973, Ser. No. 417,430
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—46 **1 Claim**

1. A new and distinct variety of raspberry plant substantially as herein shown and described characterized by its very vigorous growth, by its very stocky canes, and by its very large fruit.

3,721
POINSETTIA PLANT
Peter J. Murison, Hoddesdon, England, assignor to Mikkelsens Inc., Ashtabula, Ohio
Filed Mar. 20, 1974, Ser. No. 453,056
Int. Cl. A01h *5/00*

U.S. Cl. Plt—86 **1 Claim**

1. A new and distinct cultivar of poinsettia characterized particularly by its distinct deep pink coloring of the bracts; ease of propagation; ability to break well when pinched thereby forming a well branched, full plant, and by its dark green foliage.

PATENTS

GRANTED MAY 20, 1975

ERRATA

For CLASS	See PATENT NO.
075-108	3,883,908
228-176	3,883,945
228-121	3,883,946
085-075	3,884,099
280-011.13	3,884,315
194-059	3,884,330
263-650	3,884,454
296-136	3,884,523
062-222	3,884,663
062-296	3,884,667
204-113	3,884,681
428-036	3,884,753
428-398	3,884,754
250-359	3,884,816
250-385	3,884,817
250-480	3,884,818
260-252	3,884,827
206-322	3,884,935
424-092	3,885,011
424-177	3,885,012
260-327	3,885,044

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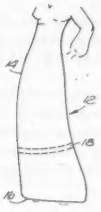
PATENTS

GRANTED MAY 20, 1975

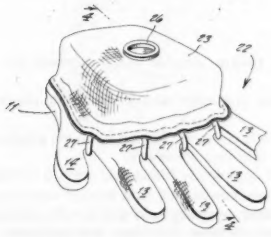
GENERAL AND MECHANICAL

3,883,896
ADJUSTABLE LENGTH GARMENT
Dona G. Cain, 723 N. Gramercy Pl., Los Angeles, Calif. 90038
Continuation-in-part of Ser. No. 293,599, Sept. 29, 1972, abandoned. This application Aug. 27, 1973, Ser. No. 391,730
Int. Cl. A41d *1/22*
U.S. Cl. 2—74 **11 Claims**



1. An adjustable length garment comprising:
an elongated length of fabric material adapted to be positioned adjacent a body portion of the wearer; and
securing means formed on the surface of said garment and transversely therearound for adjusting the length of said garment comprising tubing having an adjustable length holding member therein whose ends extend from an opening in said tubing for positioning said garment tubing on the wearer at different hem line heights said garment extending from an upper torso portion of the wearer downwardly to a hem line, said tubing being positioned in said garment intermediate said upper torso portion of the garment and said hem line said garment being formed with the top of the garment positioned at said tubing when said garment is folded, the lower edge of the inner portion of the garment adjacent the wearer being slightly higher than the hem line of the outer portion of the garment when the garment has been raised on the wearer at the hemline for enabling the garment to be worn at different hem line lengths.

3,883,897
PAINTING GLOVE
Saul Lefkowitz, and George Spector, both of c/o 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007
Filed Dec. 11, 1973, Ser. No. 423,675
Int. Cl. A41d *19/00*
U.S. Cl. 2—161 R **2 Claims**



1. A painting glove assembly comprising an outer glove adapted for being worn on a hand and an inner removable liner fitted snugly within said glove between the glove and the user's hand, said glove being made of a napped porous wool material adapted for paint application and wherein said liner includes a soft inner fibrous surface and an outer surface of water and oil resistant material, said liner further including an outwardly turned cuff portion adjacent the user's wrist overlapping the outer glove thereby forming a channel to collect paint drippings from said outer glove in further combination with a paint reservoir formed on the back side of the glove, said reservoir being lined with water and oil resistant material, including means for conducting paint from the reservoir to the palm side of said glove.

3,883,898
PROTECTIVE GLOVE FOR USE IN MEAT PROCESSING PLANTS
Robert M. Byrnes, Sr., P.O. Box 11218, Ames Avenue Station, Omaha, Nebr. 68111
Filed May 13, 1974, Ser. No. 469,863
Int. Cl. A41d *19/00*
U.S. Cl. 2—167 **1 Claim**

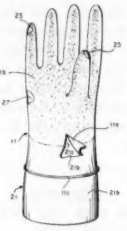
1. A glove for use by an operator in a meat processing plant who uses a knife during various meat cutting procedures in which one hand holds the knife and manipulates it adjacent the other hand which is engaged with the meat adjacent the cutting area, said glove being constructed of a flexible knitted fabric constructed of non-metallic aramid fiber, such as "Kevlar," said glove being substantially impenetrable by the knife thereby protecting the wearer from accidental injury due to cutting.

3,883,899
GLOVE
Rudolph V. Ganz, Canton, Ohio, assignor to Affiliated Hospital Products, Inc., St. Louis, Mo.
Continuation of Ser. No. 288,381, Sept. 12, 1972, abandoned, which is a continuation of Ser. No. 159,263, July 2, 1971, abandoned, which is a division of Ser. No. 876,812, Nov. 14, 1969, abandoned. This application June 26, 1974, Ser. No. 483,160
Int. Cl. A41d *19/00*
U.S. Cl. 2—168 **11 Claims**

1. An elastic latex rubber glove formed of a film of rubber latex and having palm and finger gripping exterior surfaces,
the major hand-engaging interior surface of said glove having a molded rough finish,
said exterior palm and finger gripping surfaces of said glove being rough in finish,
the entire said glove, being an integral homogeneous film of cured rubber latex,

said exterior palm and finger gripping surfaces having tiny annular craters formed thereon,

said craters being formed of depression-forming droplets of rubber latex in integral cured state relation with and forming an integral part of the base film forming said glove,



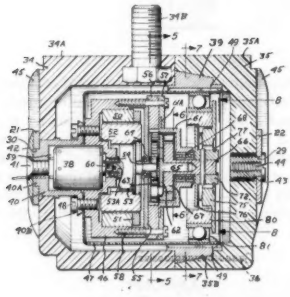
said exterior palm and finger gripping rough surface including multiple raised mesa areas of larger area than individual ones of said craters and with a plurality of said craters disposed in zones therebetween.

3,883,900

BIOELECTRICALLY CONTROLLED PROSTHETIC MEMBER

Robert B. Jerard, Brattleboro, Vt., and Cord W. Ohlenbusch, Hopkinton, Mass., assignors to Liberty Mutual Insurance Company, Boston, Mass.

Filed Sept. 7, 1973, Ser. No. 395,236
Int. Cl. A61f *1/06, 1/00*
U.S. Cl. 3—1.1 **21 Claims**



1. A prosthesis comprising a first member having a stump receiving socket and provided with a support at its distal end, a second member, a joint unit secured to the support of the first member, a pivotal connection between said joint unit and the second member relative to said first member, a drive including a direct current permanent magnet motor and a transmission housed within the unit with the output shaft of the transmission so connected to said second member that said second member is flexed relative to said first member in a direction dependent on the direction in which said motor is operating, said transmission including first and second reduction stages and a reverse locking clutch between said stages operable under the conditions that the second member is in support of a load and the motor is not operating to move the member to raise or lower the load and electric circuitry including said motor, a battery, electrodes attachable to the stump and operable to detect EMG signals from the stump muscles that were used to flex and straighten the amputee's missing joint, and signal processing means operable to convert the detected signals into signals that operate the motor in the direction and rate that corresponds to the strength of the dominant EMG signals.

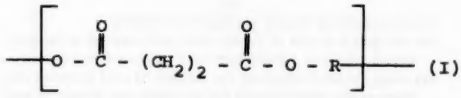
3,883,901

METHOD OF REPLACING OR REPAIRING THE BODY WITH BIORESORBABLE SURGICAL ARTICLES

Jean Coquard, Grezieu-La-Varrenne; Pierre Sedivy, Sceaux; Jean Verrier, Bologne-sur-Seine, and Michel Ruaud, Ternay, all of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed Nov. 27, 1973, Ser. No. 419,450
Claims priority, application France, Dec. 1, 1972, 72.42838
Int. Cl. A61f *1/24;* **A61l** *17/00*
U.S. Cl. 3—1 **15 Claims**

1. In a method of repairing or replacing a part of the body of a human of non-human animal by incorporating either temporarily or permanently, a surgical article, the improvement wherein the surgical article consists at least partially of a polyester of succinic acid possessing a plurality of units of the general formula:



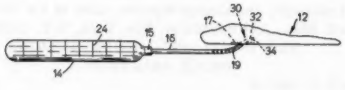
in which R represents a linear or branched alkylene radical containing 2 to 6 carbon atoms having a film- or filament-forming molecular weight.

3,883,902

VARIABLE VOLUME PROSTHETIC ASSEMBLY

Henry W. Lynch, Racine, Wis., assignor to Medical Engineering Corporation, Racine, Wis.

Continuation-in-part of Ser. No. 281,150, Aug. 16, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 428,396
Int. Cl. A61f *1/00, 1/24;* **A41c** *3/10*
U.S. Cl. 3—36 **10 Claims**



1. A closed system variable volume prosthetic assembly comprising:

a first flexible container adapted to be implanted in the body,

a second flexible container having a volume greater than the volume of said first container,

a silicone gel completely filling said second container,

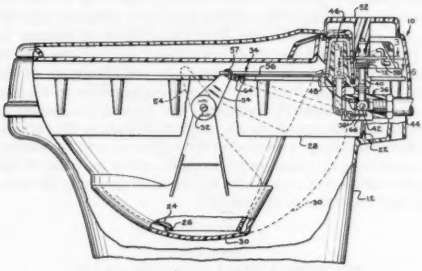
a tube sealingly connecting said second container to said first container whereby said gel can be squeezed from said second container into said first container after implantation of said first container and said assembly can be autoclaved prior to implant without contaminating the gel,

and valve means within said tube for movement to a position closing the tube after the gel has been forced into said container.

3,883,903
WATER CLOSET

Christiaan J. H. Vanden Broek, and John M. Antos, both of Ann Arbor, Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

Filed May 10, 1974, Ser. No. 468,825
Int. Cl. E03d *11/10, 1/34*
U.S. Cl. 4—85 **4 Claims**

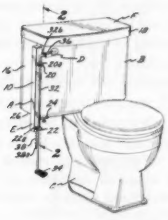


1. A water closet comprising a bowl having an open lower end, a concave pan beneath said bowl and supported thereon adjacent to the upper end thereof for pivotal movement about a horizontal axis between a first position in which said pan encloses said open lower end and a second position in which said pan is tilted in an elevated position at one side of said bowl, said pan having a depth so that when in its first position its peripheral lip is at a higher elevation than the open lower end of said bowl, water flushing means actuable for discharging flush water to the interior of said bowl, and an actuator mechanism connected to said pan and to said water flushing means and selectively operable either (1) for moving said pan to its second position and simultaneously actuating said flushing means to deliver flush water to the bowl while the pan is tilted and for returning the pan to its first position and rendering said flushing means inactive, or (2) for actuating only said flush means to deliver a desired quantity of water to said bowl while said pan is maintained in its first position.

3,883,904
FOOT ACTUATED TOILET DEVICE

Arthur W. Wittman, 12301 S. Woodruff, Downey, Calif. 90241

Filed Apr. 12, 1974, Ser. No. 460,422
Int. Cl. E03d *5/08*
U.S. Cl. 4—249 **2 Claims**



1. In combination with a toilet having a tank that pivotally supports a flushing lever, said tank including a bottom and a first vertical end wall adjacent said lever and said first wall having an upper horizontal edge, a foot operated device removably mountable on said tank for flushing said toilet, said device including:

a. a support assembly that includes an elongated body vertically disposed adjacent said first end wall, a hook mounted on the upper end of said body that engages said upper edge of said first end wall to support said body in a vertical position therefrom, an arm extending outwardly from said body, a thumb screw that engages a tapped bore in said arm, and said thumb screw when rotated in an appropriate direction in said tapped bore moving into pressure contact with said bottom to hold said assembly in a fixed position on said tank;

b. upper and lower vertically spaced brackets that project outwardly from said body and have vertically aligned bores formed therein;

c. an inverted L-shaped rod that includes first and second legs, said first leg slidably supported in said bores for vertical movement relative said tank, and said second leg disposed above said flushing lever;

d. first means on said second leg for pressure engaging said flushing lever and rotating it to a flushing position when said rod is moved downwardly relative to said body;

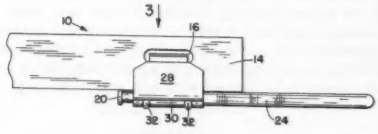
e. a pedal that may be engaged by a foot of a user, said pedal secured to said first leg and disposed at an elevated position above the floor on which said toilet rests; and

f. spring means having first and second ends, with said first end secured to said body and said second end to each rod, said spring means at all times tending to maintain said rod in a first position where said first means is adjacently disposed to and in engagement with said handle when the latter is in a non-flushing position, with said spring means capable of being temporarily deformed by a downward force exerted on said pedal to allow said rod and said first means to move downwardly to a second position and said handle to a flushing position, and said spring means moving said rod to said first position when said force is released from said pedal.

3,883,905
MATTRESS SPRING HANGER HANDLE

Robert G. Bryant, Gardner, Mass., assignor to Gem Industries Inc., Gardner, Mass.

Filed June 5, 1974, Ser. No. 476,591
Int. Cl. A47c *31/00*
U.S. Cl. 5—11 **3 Claims**

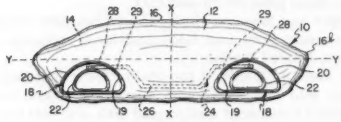


1. A hanger handle construction for a mattress support wherein said support includes an angle iron, the angle iron having a vertical portion and a horizontal portion, there being a slot in the horizontal portion,

a hanger handle including a shank and an arcuate hook portion,

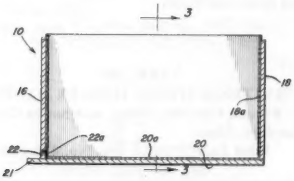
and a resilient clip, said clip having a terminal reverse portion to engage the lower edge of the vertical portion of the angle iron, a semi-cylindrical outstanding portion for engaging the shank of the hanger handle and holding it against the vertical portion of the angle iron, a terminal lock lip for snapping into said slot, and an outstanding loop at the junction of the vertical and horizontal portions of said angle iron, said clip being made of resilient sheet material and said outstanding loop increasing the resilient force of said clip.

3,883,906
SLEEPING PILLOW WITH ARM OPENINGS
Alray Sumpter, 936 W. 17th St., Port Arthur, Tex. 77640
Filed Feb. 28, 1974, Ser. No. 446,626
Int. Cl. A47g 9/00
U.S. Cl. 5—338 15 Claims



1. In a pillow for sleeping comprising, a body portion, passageway means on opposite sides of the transverse vertical center plane of said body portion and adapted to extend generally parallel to said plane for receiving therein the arms of a sleeping person, and including means pivotally mounting said passageway means relative to said body portion.

3,883,907
METAL BEEHIVE LINER
Jacob S. Foxbower, and Gerald J. Foxbower, both of Route No. 7, Box 1471, Brooksville, Fla. 33512
Filed Nov. 27, 1973, Ser. No. 419,242
Int. Cl. A01k 47/00
U.S. Cl. 6—1 9 Claims

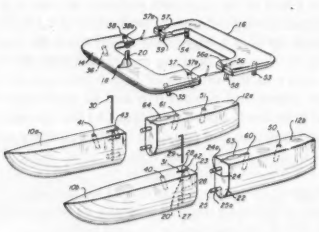


1. For use in preventing the wax moth from destroying a beehive and its contents, wherein said beehive is of the type comprising a peripheral walled enclosure having a base closing the bottom of said enclosure, said peripheral wall including an access opening therein adjacent said base, a non-corroding metal liner in said enclosure adjacent to and at least coextensive with said peripheral wall and said base, said liner including an opening therein of substantially the same size as and adapted to be aligned with said access opening.

3,883,908
METHOD FOR PREPARING COPPER TOGETHER WITH MANGANESE SULPHATE
Platon Vladimirovich Gogorishvili, ulitsa Barnova, 124 a, kv. 6; Tengiz Pavlovich Geleishvili, ulitsa Oktyabrskaya, 34, korpus 18, kv. 2; Nina Porfirievna Zarkua, ulitsa Pekina, 11, kv. 21, all of Tbilisi; Georgy Alexeevich Nikolishvili, ulitsa Leonidze, 12, kv. 85, Rustavi; Rusudan Georgievna Dundua, 1V tupik Barnova, 16, Tbilisi; Nadezhda Georgievna Svintidze, GSSR, Bolnissky raion, selo Kazreti, Madneulsky gornoobogatitelny kombinat; Nina Ivanovna Onuchkina, ulitsa Onezhskaya, 4, kv. 46, both of Leningrad; Gaioz Grigorievich Kasradze, ulitsa Saburtalinskaya, 39, kv. 31, and Genrikh Moiseevich Kuperman, ulitsa Sovetskaya 66, both of Tbilisi, all of U.S.S.R.
Filed Aug. 24, 1973, Ser. No. 391,250
Int. Cl. C22b 15/12; C01g 45/00, 45/10
U.S. Cl. 75—108 4 Claims

1. A method of preparing copper together with manganese sulphate comprising suspending a chalcopyrite concentrate and a manganese-containing raw material selected from the group consisting of manganese ore and manganese flotation concentrate in water, maintaining the resulting suspension with an oxygen-containing atmosphere at a temperature of 165°–185°C and a partial pressure of oxygen of 2.5–15 atm to thereby form a reaction mixture containing an aqueous solution of sulphates of copper and manganese, separating said solution from the reaction mixture, precipitating copper from the solution by reducing the copper sulphate with hydrogen at a temperature of 160°–180°C and a pressure of 30–40 atm whereby a portion of the copper remains in solution, separating the precipitated copper from the solution of manganese sulphate and sulphuric acid formed as a result of the copper reduction, purifying the solution from the admixture of the remaining copper by adding manganese sulphide to thereby form copper sulphide, separating the formed precipitate of copper sulphide, returning the copper sulphide to the stage of oxidative leaching, neutralizing the sulphuric acid by treating the solution with a manganese-containing raw material, isolating the solution of manganese sulphate, evaporating the solution and crystallizing the product.

3,883,909
SECTIONAL SMALL WATER CRAFT
Robert E. Fisher, and Leonard S. Matejcic, both of Boulder, Colo., assignors to Vervcraft, Inc., Boulder, Colo.
Filed Oct. 5, 1973, Ser. No. 404,039
Int. Cl. B63b 7/04
U.S. Cl. 9—2 S 11 Claims



1. In a light-weight, small water craft arranged for quick assembly and disassembly having at least two sectioned hulls and a sectioned superstructure securable to the hulls and providing crew's space, the improvement which comprises:

a. means for securing the hull sections together including mating bores in said hulls registering at the joint between said sections and including pin means extending into said bores from one hull section to the other section and including means for releasably securing pins in said bores,

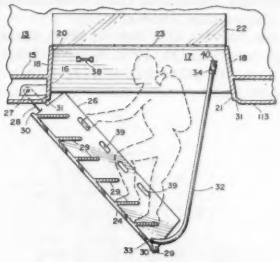
b. mating bores in said superstructure and in the hull sections and pin means extending from said superstructure into the hull sections, and

c. latch means for securing the superstructure to the hull sections and the hull sections together including a pair of second pin means telescoping in bores in adjacent sections of the superstructure and into bores in adjacent hull sections, said pair of second pin means having means securing the same together inclusive of quick release cinching and locking means whereby the whole assembly is secured in essentially rigid condition.

3,883,910
BOAT FOR SCUBA DIVERS AND THE LIKE
Bertram L. Naylor, III, 807 N.W. 7th Rd., Miami, Fla. 33136
Filed Jan. 16, 1974, Ser. No. 433,851
Int. Cl. B63b 3/00
U.S. Cl. 9—6 2 Claims

1. A boat having a hull portion for scuba divers and the like comprising a well having upwardly extending wall portions,

said wall portions extending upwardly from said hull portion to a position above the waterline of said boat, a closure member, means pivotally mounting said closure member at said hull portion, said closure member conforming in shape with said hull portion, a plurality of steps mounted in spaced relation on the inner surface of said closure member, said steps extending at such an angle with said closure member that



upon swinging said closure member to an open position said steps will extend substantially horizontaly, means for swinging and locking said closure member, a side wall extending along each side of said closure member, a plurality of hand receiving openings positioned on each of said side walls and a handle mounted on each of said well wall portions permitting a person climbing up and down said steps to grasp said handles and said hand receiving openings.

3,883,911

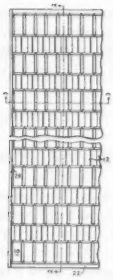
INSULATED, TUBE-FRAMED BOAT OR THE LIKE

Alvin Edward Moore, Manini Way, Diamondhead, Rt. 1, Bay St. Louis, Miss. 39520

Filed Apr. 22, 1974, Ser. No. 462,735

Int. Cl. B63b *3/00*

U.S. Cl. 9—6 **25 Claims**



1. A device of the character described, including:

strength-providing framework of a load-holding body, comprising: a plurality of upright, body-wall tubular members, each of which has a pair of end elements and, between said end elements, a plurality of tubes and joints that connect pairs of said tubes together in a line and project beyond their outlines less than an inch; at least one body-bracing frame of four elongated, end-joined, angled beams, forming the general outlines of corners of the body, having spaces between angled sides; means fastening one group of said end elements to portions of one of said angled beams and means fastening a second group of said end elements to portions of an opposite one of said beams; a set of tubular members, having axes at angles to the axes of said upright tubular members, each of which has a pair of end portions that are fixed to and between an opposite pair of said angled beams and between said end portions a plurality of tubes and tubular-member-strengthening joints that connect said last-named tubes together in a line and project transversely to said first-named axes beyond the outlines of said tubes and means fastening said end portions to opposite portions of said angled beams; a second set of tubular members having axes at angles to the axes of said upright tubular members, each of which has a pair of end portions, the said last named end portions being adjacent to and connected to parts of said upright tubular members; an elongated, tubular-member-bracing means, fixed to tubular members at a level in the vicinity of the level of said parts;

exterior, waterproofed, body-skin means, adjacent to said tubular members and tubes;

interior skin means on the inside of said tubular members; and

thermal insulation, adjacent to said tubular members.

3,883,912

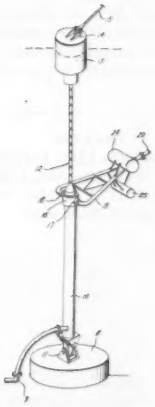
SUBMERGED HOSE ARM STABILIZING MEANS FOR SINGLE POINT MOORING SYSTEMS

Kristen I. Pedersen, Scarsdale, N.Y., assignor to Sofec, Inc., Houston, Tex.

Filed Dec. 17, 1973, Ser. No. 424,958

Int. Cl. B63b *21/52*

U.S. Cl. 9—8 P **2 Claims**



1. In a single point mooring system of the type having a buoy with means for mooring of a vessel thereto, a base anchored to the sea bottom, an upstanding cargo pipe shaft pivotally connected to said base and extending upwardly therefrom, a hose arm projecting laterally from the upper portion of said pipe shaft, a hose extending from said arm for carrying cargo to and from a vessel moored to said buoy, buoyancy tank means for supporting said arm in substantial alignment with said hose, and a pivotal connection between said arm and said pipe shaft permitting vertical swivelling of said arm relative to said pipe shaft, and hose arm stabilizing means comprising a ballast weight carried by said arm substantially laterally outwardly of said pipe shaft and substantially beneath the center of buoyancy of said arm and buoyancy tank means thereby

causing a stabilizing effect which counteracts external forces tending to dislodge the arm from its proper position.

3,883,913

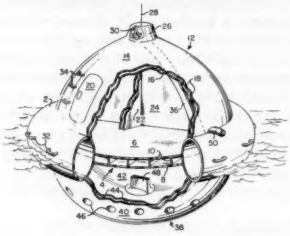
AQUASTABILIZED SURVIVAL RAFT

James A. Givens, Seattle, Wash., assignor to Res-Q-Raft, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 216,990, Jan. 11, 1972, abandoned. This application Dec. 12, 1972, Ser. No. 314,389

Int. Cl. B63c *9/04*

U.S. Cl. 9—11 A **8 Claims**



5. A stabilized inflatable float such as a life raft comprising:

bouyant means for floating on top of a liquid having a floor and inflatable flotation means surrounding said floor,

stabilizing means secured to the bottom of the bouyant means about the periphery thereof and extending downwardly therefrom, said stabilizing means comprising a flexible walled hollow chamber adapted to be filled with the supporting liquid, said chamber having a plurality of ports therein, resulting in a restricted inflow and outflow of the float-supporting liquid while creating inertia, and hollow open-ended means extending from within the chamber to a point above the surface of the supporting fluid whereby fluid captured beneath the floor may be discharged upon the buildup of excessive pressure within the chamber.

3,883,914

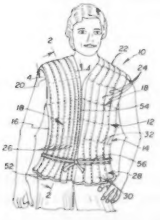
FLOTATION LIFE JACKET

Ronald L. Blair, 2650 W. Belden Ave., Chicago, Ill. 60647

Filed Sept. 7, 1973, Ser. No. 395,282

Int. Cl. B63c *9/10*

U.S. Cl. 9—341 **6 Claims**



1. A flotation jacket to be worn by a person around the upper part of the body and having spaced side openings through which the arms of the person extend, said jacket having a plurality of vertically extending cylindrical-shaped pockets formed in said jacket and extending around the front, back and sides of said jacket, a filler material vertically retained in said pockets, said filler material being of a cylindrical shape and of a foam material with the cylindrical outer surface skin coated, said skin coated outer cylindrical surface rendering the filler material impervious to water and reducing the likelihood of said filler becoming water-logged, thereby increasing the flotation capabilities of the jacket, said cylindrical filler being free to rotate or turn within each of said pockets to conform to the body of the person and his movements.

3,883,915

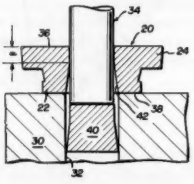
METHOD OF FORMING A NUT

Joseph H. Steward, Bloomfield Hills, Mich., assignor to Multifastener Corporation, Detroit, Mich.

Division of Ser. No. 414,469, Nov. 9, 1973, abandoned. This application Oct. 21, 1974, Ser. No. 516,318

Int. Cl. B21d *53/24;* **B23g** *1/16*

U.S. Cl. 10—86 CL **2 Claims**



1. A method of forming a nut having a threaded bore, comprising the steps of:

a. supporting the nut blank on a die having a circular opening,

b. forming in said blank a bore comprising a cylindrical portion opening at one face of said blank at one end thereof, which cylindrical portion smoothly blends into a coaxially aligned conical portion which opens through said blank at another face of said blank at an end opposed to said one end, said conical portion having a major diameter generally equal to said die opening, by impacting the nut with a high-speed cylindrical punch coaxially aligned with said die opening, said die opening having a diameter approximately 13 to 18% greater than the diameter of said punch, and

c. tapping the internal surface of said cylindrical and conical openings, forming a continuous female thread in the nut bore defined by said openings with partially formed, truncated threads in said conical portion adjacent said opposed nut end.

3,883,916

MACHINES FOR BINDING PACKETS OF PERFORATED SHEETS

Sidney George William Adams, Walton-on-Thames, and Edgar Horace Galliford, Esher, both of England, assignors to James Burn Bindings Limited, Esher, Surrey, England

Filed Jan. 21, 1974, Ser. No. 434,989

Claims priority, application United Kingdom, Jan. 23, 1973, 3499/73

Int. Cl. B42c *5/12, 19/00*

U.S. Cl. 11—1 A **2 Claims**

1. A machine for binding packets of perforated sheets or books with wire binding elements of the kind having a series of curved prongs on which the sheets are impaled before the prongs are closed to ring-shape by bringing their points into the vicinity of their roots, said machine comprising

an endless chain adapted to interengage a continuous strip of said binding element for delivering said continuous strip to a reception station,

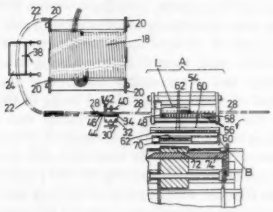
a cutter head located at said reception station for cutting predetermined lengths of said binding element from said continuous strip,

intermittent drive means connected with said endless chain, said intermittent drive means stopping said endless chain after a predetermined length of said continuous strip has

been fed into said reception station and starting said endless chain after said predetermined length has been removed from said reception station, thereby intermittently delivering said continuous strip into said reception station,

sensor means interconnected with said intermittent drive means and said cutter head, said sensor means causing said intermittent drive means to stop and activating said cutter head upon sensing a predetermined length of said continuous strip within said reception station,

transfer means adapted to move on a path transverse to the length of said continuous strip between a first position adjacent said reception station and a second position adjacent a binding station, said transfer means including



a series of guide ribs oriented transverse to the direction path of said continuous strip into said reception station, and including magnet means for retaining said wire binding element in operational relation therewith during transfer, and

pusher means adjacent said reception station and said transfer means, said pusher means including a plurality of nonmovable ribs oriented transverse to the direction path of said continuous strip and in line with said guide ribs, said transfer means and said pusher means cooperating to move a predetermined length of said continuous strip along a path transverse to its length onto said transfer means while retaining that continuous strip in desired position relative to the binding station.

3,883,917

BRIDGE FOR RAMPS

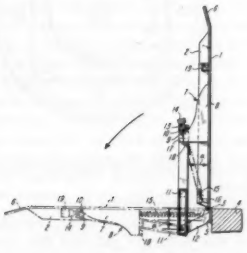
Kurt Alten, Ringstr. 14, 3015 Wenningsen, Germany

Filed Nov. 16, 1973, Ser. No. 416,391

Claims priority, application Germany, Nov. 20, 1972, 2256802

Int. Cl. B65g *11/00*

U.S. Cl. 14—71 **5 Claims**



1. In combination with a ramp, a bridge structure pivotally connected to said ramp for transferring a load over said bridge structure onto and from said ramp, said bridge structure including: a bridge plate, hinge means hingedly connecting one end portion of said bridge plate to said ramp for selectively pivoting said bridge plate about the axis of said hinge means from a substantially vertical rest position to an at least approximately horizontal position of use and vice versa, tension lever means pivotally supported by said ramp for pivoting about an axis substantially parallel to the axis of said hinge means and located in spaced relationship thereto, spring means having one end thereof anchored within the region of said axis of said hinge means and having the other end anchored within the region of the free end of said lever means, and cam means connected to said bridge plate and having a cam surface supporting said free end of said lever means, said spring means continuously urging said free end of said lever means toward said cam surface and having its shortest extension when said bridge plate occupies its substantially vertical rest position, that end of said tension spring means which is within the region of the axis of said hinge means being connected to said bridge plate, the length of said lever means approximately being equal to half the length of said bridge plate, said lever means in its substantially vertical rest position being spaced from said bridge plate by a distance approximately equalling the distance between the horizontal plane through the axis of said hinge means and the pivot axis of said lever means, said cam surface having an S-shaped contour and that portion of said cam surface which in the substantially vertical rest position of said bridge plate is closest to said roller means being concave whereas the other portion of said cam surface has a convex surface, said concave and said convex portions of said cam surface merging with each other at about the central region of said cam surface, and in said substantially vertical rest position of said bridge plate said roller means engaging and exerting pressure upon said convex portion of said cam surface.

3,883,918

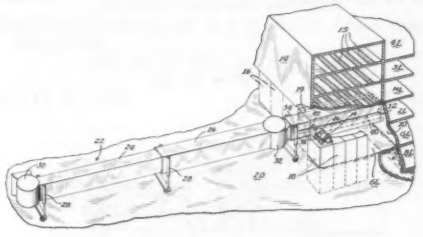
TELESCOPIC CONNECTION FOR THE PROXIMATE END OF AN AIRPORT PASSENGER BRIDGE

John W. Magill, 664 N. Michigan Ave., Chicago, Ill. 60611

Continuation-in-part of Ser. No. 396,716, Sept. 13, 1973. This application Jan. 14, 1974, Ser. No. 433,006

Int. Cl. B65g *11/00*

U.S. Cl. 14—71 **1 Claim**



1. The combination with an outside wall of a multi-level airport terminal building having a ground floor level, a second floor level, and a mezzanine level, said wall projecting upwardly from the inside edge of an adjacent ground level cargo loading zone and having formed therein a rectangular passenger doorway in communication with the second floor level, and a tubular rectangular corridor-forming enclosure extending horizontally along and disposed outwards of said wall, positioned in overhanging relationship with respect to the cargo loading zone and in alignment with the space over the mezzanine level, and having a horizontal bottom wall disposed at mezzanine floor level and an outside vertical wall spaced forwardly of the building wall, of a telescopic connection for establishing two-way passenger communication between said doorway and the proximate end of an elongated passenger bridge which is tractionally supported on the ground in said cargo loading zone, said telescopic connection comprising a

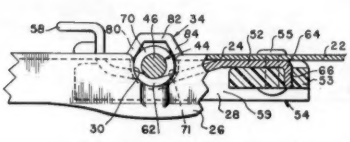
fixed outer sheathe in the form of a tubular tunnel-like passageway having its inner end in communication with said doorway and embodying horizontal top and bottom walls and vertical side walls, said sheathe closely directly underlying the corridor-forming enclosure and having its outer end terminating substantially in vertical alignment with the outer vertical wall of said corridor-forming enclosure, the bottom wall of the sheathe lying at second floor level, an inner movable tubular extension in the form of a tunnel-like passageway embodying horizontal top and bottom walls and vertical side walls, said extension being slidably disposed in telescopic fashion within said sheathe, having its outer end hingedly connected to the proximate end of said passenger bridge, and being movable between a retracted position wherein it is disposed substantially wholly within the confines of the sheathe and an advanced position wherein it is projected outwardly of the sheathe so that it is disposed for the major part thereof outwardly of the outside vertical wall of the corridor-forming enclosure, a series of antifriction rollers carried by said extension and designed for tractional engagement with the bottom wall of the tubular sheathe, an elongated toothed rack mounted on one vertical side wall of the extension and substantially midway between the upper and lower edges thereof, a stationary gear reduction device disposed exteriorly of the sheathe and having its output shaft projecting through an adjacent side wall of the latter, a stationary reversible electric motor having a drive shaft operatively connected to the input shaft of said gear reduction device, and a pair of telescopic pylons extending between the forward end region of the extension and the ground and having traction wheels at the lower ends thereof for tractionally supporting the outer end of the extension.

3,883,919

BLADE CONNECTION STRUCTURE TO ARM

William H. Harbison, Merrillville, and Leo J. Wubbe, Beverly Shores, both of Ind., assignors to The Anderson Company, Gary, Ind.

Filed Mar. 18, 1974, Ser. No. 451,749
Int. Cl. B60s *1/40*
U.S. Cl. 15—250.32 **6 Claims**



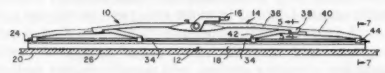
1. In a windshield wiper blade assembly having a bridge member operatively connected to a wiping element, said bridge member having a top wall and depending side walls, connector means on said bridge member for removably connecting said blade to a wiper arm, said connector means comprising a raised portion in said top wall and a pair of apertures in said side walls aligned with each other and having said raised portion extending therebetween, said raised portion having at least two planar sections angled upwardly from said top wall, and latching spring means operatively associated with said connector means, whereby a pin on said wiper arm is latched to said blade by said spring means urging said pin against said planar sections in line contact with each section.

3,883,920

BRIDGE TO LINK CONNECTION

William H. Harbison, Merrillville; John J. Plisky, Munster, and Michael G. Mohnach, Merrillville, all of Ind., assignors to The Anderson Company, Gary, Ind.

Filed Mar. 18, 1974, Ser. No. 451,751
Int. Cl. B60s *1/38*
U.S. Cl. 15—250.42 **4 Claims**



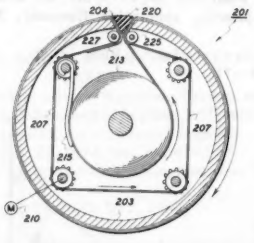
1. In a wiper for cleaning a windshield comprising a pressure distributing superstructure, a resilient wiping member, a flexible backing strip operatively associated with said wiping member, and a pair of spaced apart abutments carried by said wiping member, said superstructure having in combination a primary yoke and a secondary yoke, said secondary yoke being formed of plastic material and being in slidable engagement with the backing strip outboard of one of said abutments, said primary yoke being formed of metal material and having inturned means on at least one end portion thereof, said plastic secondary yoke having an entry portion intermediate the ends thereof, means projecting from said intermediate portion of said secondary yoke inboard of said entry portion, said inturned means of said primary yoke pivotally engaging with said projecting means of the secondary yoke, stop means on said secondary yoke inboard of said projecting means and engaged by said inturned means of said primary yoke as the inboard claw means on said secondary yoke is urged in an outboard direction by said abutment means on said wiping member for holding said superstructure firmly on said wiping member and backing strip.

3,883,921

CLEANING ROLL APPARATUS HAVING REJUVENATED CLEANING SURFACE

Raghulinga R. Thettu, Webster, and William T. White, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 19, 1973, Ser. No. 417,015
Int. Cl. G03g *15/00*
U.S. Cl. 15—256.52 **6 Claims**



1. An improved cleaning roll apparatus for cleaning heated surfaces comprising:

a core member formed with a slot;

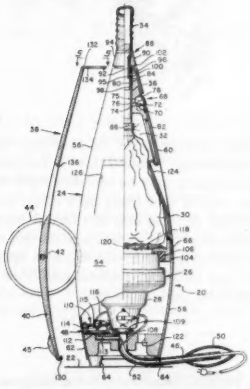
a flexible endless belt member encircling said core member;

A roll of thin polyester polymer film material disposed interior to the belt member and extending on overlying relationship with the belt member at one end thereof, said film material becoming tackified upon raising its temperature to a predetermined level;

means for driving said belt member causing said roll of material to unwind onto the outer surface overlying the belt member into contact with a heated surface to be

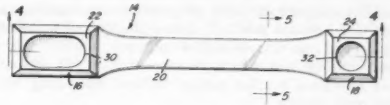
cleaned at predetermined intervals to effect a rejuvenated cleaning surface.

3,883,922
VACUUM CLEANERS
Eugene T. Fleischhauer, 176 West Ln., Renovah Woods, Stamford, Conn. 06905
Filed Jan. 2, 1973, Ser. No. 320,055
Int. Cl. A47l *5/36*
U.S. Cl. 15—327 R **15 Claims**



13. A canister type vacuum cleaner, which comprises: an elongated outer casing; a motor housed in said casing adjacent one end thereof; a pump housed in said casing and drive-connected to said motor; a suction hose; means for detachably fixing said hose to said casing with one end of the hose aligned with the longitudinal axis of the casing and communicating with the interior of the casing at the end of the casing opposite the motor, there being a compartment for a bag in the region of said casing into which said hose extends and said casing having a lower, surface engaging wall portion which is free of protuberances on which said vacuum cleaner can slide freely forward and backward and pivot as said vacuum cleaner is moved relative to the surface on which it is supported, said casing further having an upper wall means which is generally coextensive in length with said lower wall portion and has a continuously convex longitudinal contour, and said upper wall means including a movable portion overlying the bag housing compartment in the vacuum cleaner casing and an immobable portion; hinge means fixing one end of said movable portion to said immovable portion for pivotal movement about an axis extending transversely across said cleaner, said hinge means not protruding above the exterior surface of said upper wall means; latch means for fixing the other end of said movable portion to said immovable portion whereby said movable portion may be pivoted about said transverse axis following manipulation of said latch means to provide access to said compartment for the removal and replacement of bags, said latch lying below the surface of said upper wall means; and a hand grip integrally formed in the movable portion of said upper wall means below the surface thereof, whereby said vacuum cleaner can freely move forward and backward and pivot as said vacuum cleaner is moved relative to the surface on which it is supported by manipulation of said hose means even when it is said upper wall means that is in contact with said surface.

3,883,923
APPLIANCE AND FURNITURE FLOOR SKIS
Harold H. England, 8403-135 St., Edmonton, Alberta, Canada (T5R-0B6)
Filed June 1, 1973, Ser. No. 366,032
Int. Cl. A47b *91/06*
U.S. Cl. 16—42 **3 Claims**

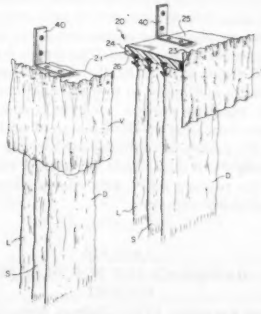


1. A reversible appliance and furniture floor ski, comprising, in combination:

a. first and second means, each including a pad, for movably supporting a spaced pair of article supports and allowing sliding movement of the article supports, each pad having parallel top and bottom faces, the top face of each pad being provided with a recess forming a socket arranged for receiving an article support and the bottom face provided with a pair of substantially parallel rounded edges and means for slidably contacting an article supporting surface for protecting same during resting and displacement of the article, the recess of one of the pads being elongated in a direction extending toward the other of the pads for permitting the pads to receive supports of different spacings, the rounded edges being transverse of the direction of elongation and forming leading and trailing edges of the pads; and

b. substantially rigid tieing means affixed to each pad for connecting together the first and second movably supporting means with sufficient strength to prevent the pads from twisting, turning, and digging into the article supporting surface, the tieing means being a longitudinal member arranged extending between and connected to the pads, and spaced from the article supporting surface.

3,883,924
DRAPERY SUPPORT MEMBER
Julia Maras Grabman, Rt. 6, P.O. Box 30, Grand Rapids, Mich. 55744
Filed Dec. 21, 1973, Ser. No. 427,401
Int. Cl. A47h *1/04*
U.S. Cl. 16—94 D **1 Claim**



1. Apparatus for supporting a plurality of hanging structures from a building wall, comprising an elongated body having a front wall, rear wall, first and second end walls, and top and bottom walls, a plurality of first track means extending the full length of said bottom wall in generally parallel relationship with each other and said front wall, a plurality of spacer means disposed between at least one of said first track means and

said bottom wall of said body so that said one of said first track means is maintained in spaced relationship to said bottom walls of said body, second track means disposed along the full length of said front wall, third track means detachably mounted on each of said first and second end walls of said body, each of said third track means being substantially coplanar with said second track means, a plurality of bracket means for supporting said elongated body on the building wall, said bracket means having one leg engaging the wall and a second leg extending substantially perpendicular to said first leg and disposed between said one of said plurality of said first track means and said bottom wall of said body, whereby said spacer means permit said body to be supported on said second leg of said mounting bracket means without interfering with said first track means.

3,883,925

APPARATUS FOR FILLING TUBULAR CASINGS

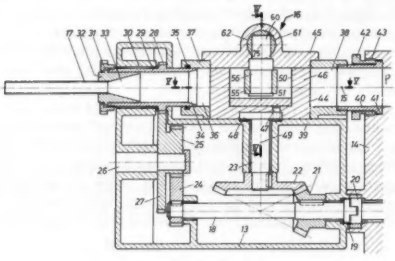
Johannes Muller, Biberach/Riss, Germany, assignor to Albert Handtmann and Metallgubwerk, Armaturen-und Fleischereimaschinen Fabrik, Biberach/Riss, Germany

Filed Apr. 24, 1972, Ser. No. 246,996

Claims priority, application Germany, Apr. 29, 1971, 2121006

Int. Cl. A22c *11/02, 11/10*

U.S. Cl. 17—33 **12 Claims**



8. Apparatus for filling tubular casings with comminuted substances, comprising locating means for supporting an endless casing on a rotatable nozzle, a proportioning pump having an outlet communicating with said nozzle and an inlet communicating with a source of said substance, means for driving said proportioning pump to expel successive volumetric portions of said substance through said nozzle into said casing with an interval between successive expulsions several times shorter than the length of expulsion, and drive means for continuously rotating said nozzle at a cyclically variable speed between a maximum and a minimum, to twist off said casing after each successively expelled portion to form a link thereof, and means for synchronizing the drive means of said proportioning pump with the means for continuously driving said nozzle to simultaneously drive said nozzle so that the maximum speed said nozzle for twisting said casing occurs during the interval between successive expulsion.

3,883,926

FLEXIBLE HANGER CLAMP FOR ELECTRICAL LAMP SOCKET

Rodney Kent Reynolds, 17919 Holmes Ave., Cerritos, Calif. 90701

Filed Nov. 23, 1973, Ser. No. 418,665

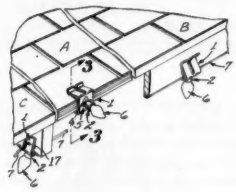
Int. Cl. A44b *21/00;* **A47g** *33/16*

U.S. Cl. 24—73 CP **3 Claims**

1. A flexible hanger for mounting an elongated lamp fixture, of the type including a flat end having electrical leads projecting from the opposite sides thereof, on a mounting member having a flat side and comprising:

a base having a length greater than the width of said mounting member and including a through opening for confronting said flat side for projection therethrough of said elongated fixture; and

a pair of flexible legs projecting coextensively in one direction from the opposite ends of such base and angling inwardly to terminate in gripping feet spaced apart, in their unflexed condition, a distance less than the width of



said mounting member, one of said legs being formed with an elongated open ended slot for receipt of said lead whereby said fixture may be inserted from the back side of said base, one of said leads then fitted in through the open end of said slot and said feet flexed apart for receipt over said mounting member and said hanger slid onto said mounting member to abut said flat end against said flat side and to trap said leads behind said base to hold said fixture captive on said member.

3,883,927

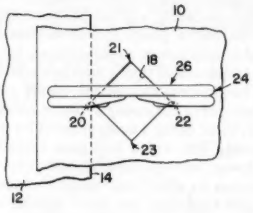
LATCHING DEVICE

Robert Charles Francis, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 9, 1973, Ser. No. 404,392

Int. Cl. A44b *21/00*

U.S. Cl. 24—81 **8 Claims**

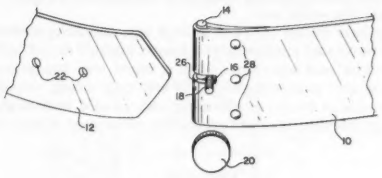


1. A latching device comprising: a first member having an edge; a second member positionable adjacent to the first member and having an opening with at least two notches, one of said notches being proximate to the edge of the first member when the first member is adjacent the second; a resiliently deformable latch element mounted in the opening and having a handle portion on one side of the second member and a pair of opposite hool elements extending through the opening and overlapping the opposite sides of said member, said handle portion being resiliently deformed when the hook elements are disposed in the opening to bias the hook elements away from each other and against the opposite side of the opening, the latch element being rotatably shiftable in the opening between a first position, wherein the opposite hook elements seat in said pair of opposite notches including said one notch and the hook element in said notch overlaps the second member and the edge of the first member when the members are adjacent each other to lock the members together, and a second position wherein said one hook element clears the first member, said shifting being accomplished upon resilient deformation of the latch elements to allow the hook elements to unseat from the notches.

3,883,928
BELT BUCKLE

Gerald L. Blake, 1412 Hampshire West, Silver Spring, Md. 20903

Filed July 8, 1974, Ser. No. 486,597
Int. Cl. A44b *11/06, 11/20*
U.S. Cl. 24—163 R **5 Claims**



1. A belt buckle for a belt having a pierced end and a yoked loop end with a central tongue slot through which the tongue normally extends from its shaft which is held in the yoked loop of the belt, comprising

a pin mounted in said yoked loop and

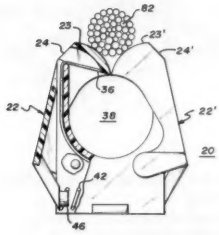
a bolt extending through said slot at the inner side of said pin and forming a tongue protruding normally from the face of said loop end of the belt for receiving said pierced end at a selected hole therein, and

a clamp nut for mounting on the protruding end of said bolt to clamp said belt ends together in buckled position.

3,883,929
CABLE CLAMP ASSEMBLY

William A. Fortsch, Livingston, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Sept. 10, 1973, Ser. No. 396,098
Int. Cl.[2] F16G *11/00;* **A44B** *21/00*
U.S. Cl. 24—132 R **17 Claims**

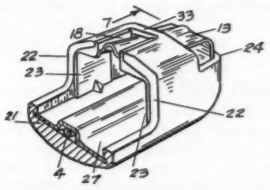


1. A cable clamp assembly comprising: a frame member having a base portion and a pair of spaced upstanding supports, said supports extending from said base portion to define a cable receiving cavity therebetween; a first arm and a second arm arranged in a pair, each of said first and said second arms having an upper portion and a lower portion, said upper portions each having a free end, said lower portion of each of said first and second arms being pivotally coupled to said frame member generally adjacent said frame member base portion; biasing means operatively coupled to said lower portion of each of said first and second arms to cause said free ends of said upper portions thereof to be urged towards one another in contacting engagement to encompass at least a portion of said cable receiving cavity; and an elastomeric strip coupled to said frame member supports and spanning the space therebetween generally adjacent said upper portions of said first and second arms, said first and second arms being movable independently of said elastomeric strip and arranged to pivotingly spread apart and away from said cable receiving cavity to provide access to said elastomeric strip, said elastomeric strip being arranged to receive a cable to provide a cradle thereabout within said frame member cable receiving cavity.

3,883,930
SAFETY PIN

Dante V. Bagnasco, Port Washington, N.Y., assignor to Safety Snap Pin Corporation, Clifton, N.J.

Continuation-in-part of Ser. No. 229,798, Feb. 28, 1972, abandoned. This application Dec. 7, 1973, Ser. No. 422,795
Int. Cl. A44b *9/10*
U.S. Cl. 24—156 R **10 Claims**



1. A safety pin of the character described having supporting base structure, a pin shaft mounted thereon with opening bias, wing members mounted at opposite sides respectively of the base structure and having inwardly extending overhanging portions with the respective opposing edges spaced from each other, and a spring strip that is mounted on the base structure and biased to bridge the respective undersides of the overhanging portions for retaining the pin shaft in closed position, wherein the improvement comprises:

a. a rigid flange extending transversely and outwardly from each of the opposing edges of the overhanging portions to form a pin guide slot generally parallel to the pin shaft and overlying the spring strip;

b. the spring strip having oppositely inclined cam faces that extend into the guide slot and each cam face forming with the adjacent guide flange a generally V-shape trough respectively to receive the pin shaft;

c. the pin on entering the trough engaging the corresponding rigid guide flange and cam face to cam downwardly the spring strip, thereby allowing the pin to move laterally from the strip and beneath the corresponding overhanging portion;

d. and buttressing means located on the outer sides of the wing members and along the overhanging portions respectively, to join the corresponding flanges and maintain the flanges and wing members rigid with respect to the spring strip.

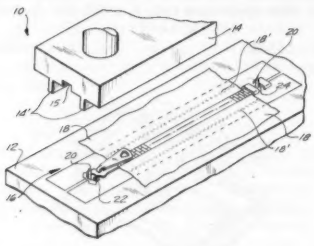
3,883,931
ZIPPER STRUCTURE

Everett A. Peterson, Roslyn Heights, N.Y., assignor to Everett A. Peterson, Roslyn Heights, N.Y.

Filed Nov. 5, 1973, Ser. No. 412,568
Int. Cl. A44b *19/36, 19/34*
U.S. Cl. 24—205.11 R **5 Claims**

1. A zipper adapted to be heat sealed to a pair of sheets of thermoplastic material in a heat sealing die structure, said zipper comprising a pair of zipper tapes having first and second end portions, a pair of rows of zipper teeth respectively secured to said zipper tapes and adapted to be intermeshed to secure said tapes together, said zipper teeth rows extending between positions on said tapes inwardly of said first and second end portions thereby to define first and second toothless zones respectively on said zipper at the first and second end portions thereof; a zipper slide mounted on said row of zipper teeth wherein said zipper teeth are engaged when said

slide is adjacent said first toothless zone, a first rigid bridge member operatively secured to said zipper tapes across said first toothless zone substantially adjacent to the zipper teeth at the adjacent end of said row and positioned such that it defines a first confined and marginally bounded opening in said tape between the bridge and slide when the zipper is closed, for receiving a first mounting projection on said die structure, and means operatively and permanently secured to said zipper tapes across said second toothless zone adjacent to



the zipper teeth at the adjacent end of said row for forming a bottom stop for said slide and having a second confined and marginally bounded opening in said means between the zipper tapes at said second toothless zone when the zipper is closed for receiving a second mounting projection on said die structure whereby said zipper is adapted to be supported in said relatively fixed position in said die structure between said mounting projections on said structure which projections respectively extend through said openings during heating sealing of said zipper tapes to said thermoplastic sheets.

3,883,932

PUSH BUTTON FASTENING DEVICE FOR SAFETY BELT PORTIONS

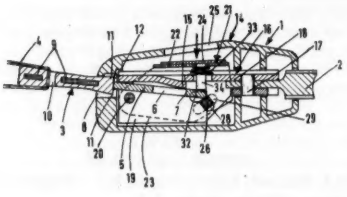
Hermann Meiller, Amberg, and Horst Hocke, Mimbach, both of Germany, assignors to Willibad Grammer, Amberg, Germany

Filed July 29, 1974, Ser. No. 492,784

Claims priority, application Germany, Aug. 7, 1973, 2339910

Int. Cl. A44b *19/00*

U.S. Cl. 24—230 A **11 Claims**



1. A push button fastener device for releasably fastening two safety belt portions, said device comprising, in combination:

a. a fastener body having an insertion aperture in one end, for inserting a tongue securable to one safety belt portion;

b. means for securing the other safety belt portion to the other end of said fastener body;

c. an abutment on said fastener body engageable with a transverse ridge on said tongue;

d. two spaced apart substantially parallel side walls on the fastener body, having aligned slots arranged obliquely relative to a line extending between said one end and said other end of said body;

e. an operating member pivotally mounted on said fastener body, about an axis perpendicular to said side walls, said operating member being of U-shaped cross-section, having a web portion constituting a push button and two side flanges, one adjacent each of said side walls of the fastener body, said flanges having aligned slots arranged at least partly obliquely relative to said line, transverse to said slots in said side flanges and at least partly overlying said slots in said side flanges;

f. a pin passing through said slots in said side flanges and said side walls; and

g. resilient means effective to urge said operating member to move said pin to engage a tongue inserted in said body, so that said transverse ridge is urged into engagement with said abutment, release of said ridge being normally prevented by the cooperating ends of said slots nearest said insertion aperture precluding movement of said pin.

3,883,933

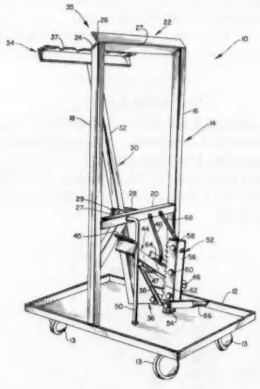
LOCKING APPAREL CLAMP

Neal B. Kightlinger, and Rufus W. Woodall, both of Gainesville, Ga., assignors to Gainesville Manufacturing Co., Inc., Gainesville, Ga.

Filed Apr. 15, 1974, Ser. No. 460,977

Int. Cl. A44b *21/00*

U.S. Cl. 24—250 R **16 Claims**



1. An apparatus for clamping and supporting apparel such as trousers comprising:

a stationary support member;

an adjustable clamp member;

means for mounting said clamp member for relative movement with respect to said support member to define a pair or jaws, said clamp member including a cam having an operative surface extending toward said support member;

an actuation rod movable in sliding engagement with said cam surface to cause said clamp member to move with respect to said support member; and

ratchet means independent of said cam for locking said adjustable member into a position with respect to said support member.

3,883,934

WIRE CLIP

William P. K. Rochfort, Fargo, N. Dak. 58102

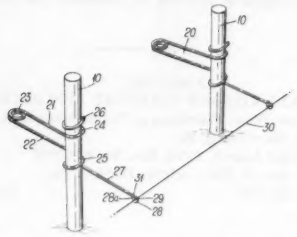
Filed Nov. 5, 1973, Ser. No. 413,174

Int. Cl. A44b *21/00*

U.S. Cl. 24—261 R **8 Claims**

1. A clip comprising:

a. a pair of legs arranged at an angle to one another;
b. means interconnecting said legs adjacent one end thereof;
c. a helical portion in each of said legs at a position spaced from the interconnection of said legs, said helical portions having substantially at least one helix for embracing a post member and arranged with their axes substantially parallel to one another and offset laterally in a normal at-rest state of the clip, said helical portions further being offset in a direction parallel to said axes;



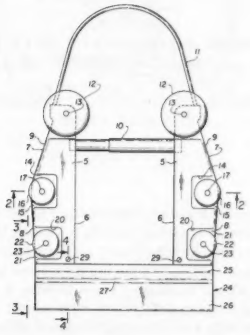
d. a further leg portion extending from and substantially beyond one of said helical portions, said further leg portion terminating in a free outer end having an open throated eye radially spaced from a post member passing through and embraced by said helical portions; and
e. means resiliently resisting movement of the helical end portions from their at-rest offset relative positions to a position wherein their respective axes are substantially coincident with one another.

3,883,935

SPREADER FOR USE WITH COMPRESSIVE SHRINKING MACHINES FOR TUBULAR KNIT FABRICS

Frank Catallo, 84 Wheatly Rd., Old Westbury, N.Y. 11568, and Donald Foreman, 160 Puritan Dr., Scarsdale, N.Y. 10583

Filed Feb. 11, 1974, Ser. No. 441,478
Int. Cl. D06c *5/00*
U.S. Cl. 26—55 R **4 Claims**



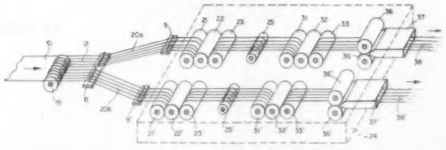
1. In a spreader for preparing a circular knit fabric tube for direct introduction into the receiving end of an associated opposed twin belt type of compressive shrinking machine; a frame comprising a pair of frame members arranged in spaced parallel relation and having outer edge portions symmetrically tapered; a horizontal guide attached to and extending forwardly from said frame for initiating the spreading and flattening of said fabric tube; two sets of laterally spaced upper and lower idler wheels mounted adjacent the front of said frame and freely rotatable about vertical axes, portions of the peripheries of said idler wheels extending laterally beyond the associated edges of said frame; two sets of oppositely driven, symmetrically opposed, upper and lower tapered rolls located intermediate the front and rear ends of said frame for advancing said fabric tube by engagement with face portions thereof adjacent the lateral edges thereof; two sets of laterally spaced upper and lower idler wheels of symmetrically opposed frustoconical configuration mounted on said frame members in opposition to said tapered rolls and freely rotatable about vertical axes whereby to define fabric-receiving nips between the opposed surfaces of said tapered rolls and said frustoconical idler wheels; and a horizontal tucker blade spanning the rear of said frame and attached to the rear ends of said frame members for introducing said spread and flattened fabric tube into the receiving end of said associated compressive shrinking machine.

3,883,936

DRAW-CRIMPING TEXTILE FILM STRANDS

Robert K. Stanley, 620 Meadowvale Ln., Media, Pa. 19063

Continuation-in-part of Ser. No. 336,617, Feb. 28, 1973, Pat. No. 3,835,513, which is a continuation-in-part of Ser. No. 124,213, March 15, 1971, Pat. No. 3,753,275, which is a continuation-in-part of Ser. No. 822,429, May 7, 1969, Pat. No. 3,570,083, which is a continuation-in-part of Ser. Nos. 678,428, Oct. 26, 1967, Pat. No. 3,462,814, and Ser. No. 302,758, July 31, 1963, Pat. No. 3,376,622, said Ser. No. 216,525, is a continuation-in-part of Ser. No. 846,457, July 31, 1969, Pat. No. 3,781,852, which is a continuation-in-part of Ser. No. 835,883, June 9, 1969, Pat. No. 3,559,254, which is a continuation of Ser. No. 349,338, March 8, 1964, Pat. No. 3,348,283. This application May 10, 1974, Ser. No. 468,731The portion of the term of this patent subsequent to Aug. 21, 1990, has been d · claimed.
Int. Cl. D02g *1/12*
U.S. Cl. 28—72.14 **12 Claims**



1. Continuous draw-crimping process for textile film strands, comprising the sequentially contiguous steps of tensioning a multiplicity of drawable textile film strands and thereby drawing them simultaneously to increased length in a plurality of drawing steps arranged side by side in a drawing zone and then compressively crimping the drawn strands.

3,883,937

METHOD OF FABRICATING A MICROMINIATURE ELECTRONIC TRIMMER CAPACITOR

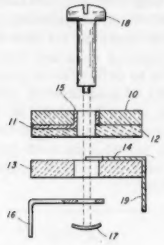
Dale Bruce Alexander, Richardson, and James Hayden Johnstone, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 3, 1974, Ser. No. 502,312
Int. Cl. H01g *13/00*
U.S. Cl. 29—25.42 **8 Claims**

1. A method of fabricating a variable microminiature capacitor comprising the steps of:
a. providing two similar disc-shaped non-conductive substrates each having a center opening therein;
b. firing one of said substrates;
c. lapping flat one major surface of said one substrate;
d. depositing a metal coating on a portion of said one major surface of said one substrate and extending into a portion of the center opening thereof, the metal coating on said one major surface forming a rotor electrode;

e. forming a layer of dielectric material on said one major surface of said one substrate completely covering the deposited metal electrode and the remaining portion of said one major surface;

f. affixing a metal stator electrode to one major surface of the other substrate;



g. sandwiching said first and second substrates together with said layer of dielectric material and said stator electrode forming an interface therebetween; and

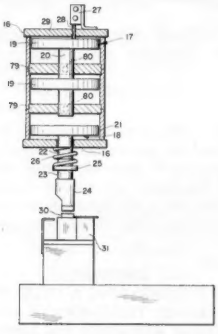
h. inserting a shaft member having an adjusting head on one end thereof through the center openings in said substrates, said shaft member making positive electrical and mechanical contact with the metal extending into the center opening of said one substrate and freely movable within the opening in said second substrate.

3,883,938

FLUID-POWERED CRIMPING PRESS

Alfred W. Schmidt, P.O. Box 787, Keystone Heights, Fla. 32656, and Richard B. Freeman, 3354 Dorchester Rd., Shaker Heights, Ohio 44120

Filed Mar. 4, 1974, Ser. No. 447,555
Int. Cl. B21f *15/00*
U.S. Cl. 29—203 DT **18 Claims**



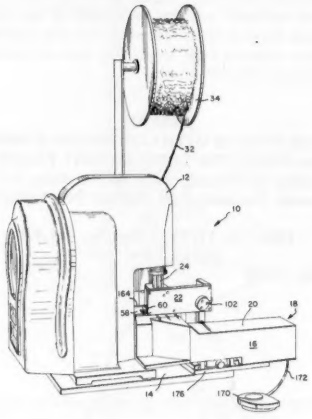
1. In a power-operated crimping press for tape-carried workpieces to be crimped, the combination of a fluid-powered first hydraulic cylinder with a ram for engaging the workpieces and exerting a crimping force thereon, press-actuating means for directing fluid under pressure to said press, first electrically-operated valve means blocking said fluid flow in its non-energized mode, spring means associated with said ram to yieldably advance said ram toward workpiece-engaging position, first electrical switch means for enerizing said first electrically-operated valve means to open position in response to closing of said switch means by movement of said ram to said workpiece-engaging position, a second hydraulic cylinder, a feed mechanism for sequentially advancing said tape-carried workpieces to crimping position and powered by said second cylinder, second valve means responsive to opening of said first electrically-operated valve means for controlling pressure fluid to said ram to cause crimping thrust of said ram, third valve means responsive to attainment of a predetermined crimping pressure by said ram for directing fluid pressure to retract said ram in opposition to said spring means and to cause resetting of said feed mechanism, and fourth valve means responsive to retraction of said ram for relieving fluid pressure on said first cylinder and directing fluid pressure to said second cylinder to advance said feed mechanism and index said tape while said spring means is advancing said ram to workpiece-engaging position to complete the operative cycle.

3,883,939

MANUALLY LOADED TERMINAL APPLICATOR

Donald Andrew Wion, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed June 5, 1974, Ser. No. 476,750
Int. Cl. H01r *43/04*; **H05k** *13/04*
U.S. Cl. 29—203 DS **14 Claims**



1. In an apparatus for applying terminals to the ends of wires including a terminal applying station, a loading station, and a conveyor extending between said loading station and said terminal applying station and having transverse longitudinally spaced slots adapted to receive wires therein at said loading station, each slot being defined by elastomeric material and having an open side and an opposed closed side;

the combination therewith of

means to position a wire into a slot at said loading station, said means comprising

wire engaging means, and

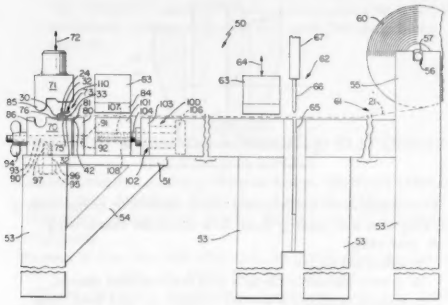
moving means operable to move said wire engaging means from a first position remote from the closed side of a slot at said loading station to a second position adjacent said closed side, said wire engaging means forcing said wire into contact with the closed side of said slot as it moves towards its second position.

3,883,940

APPARATUS FOR FASTENING A HOLDING BAR ON A PRINTING BLANKET

William T. Wagner, Dayton, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 349,345, April 9, 1973. This application July 11, 1974, Ser. No. 487,509
Int. Cl. B23p *11/00*
U.S. Cl. 29—243.58 6 Claims



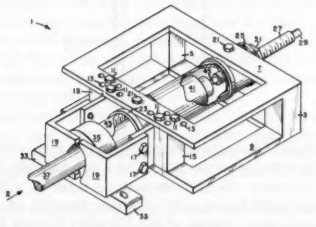
1. An apparatus for fastening a holding bar on a printing blanket; said holding bar having a bight and a pair of diverging legs extending outwardly from opposite ends of said bight; said apparatus comprising; an anvil; hammer means; fastening means for detachably fastening said holding bar to said anvil; said fastening means comprising, a cutout in said anvil defining a clamping surface, a clamping member which is movable toward and away from said cutout and having a cooperating clamping surface, said clamping surfaces being adapted to engage the outside surface of said bight and the terminal end of one of said legs respectively to clamp said holding bar against said anvil and thus enable a terminal end of said blanket to be urged between said diverging legs and against said bight; and positioning means for positioning and holding said blanket to enable said other leg to be engaged by said hammer means to deform said leg so that said legs are arranged substantially parallel with said projections piercing said blanket to fix said holding bar firmly in position.

3,883,941

UNIVERSAL-TYPE, PILLOW-BLOCK BEARING PULLER

Frederick J. Coil, 109 Latham Trailer Cts., Latham, N.Y. 12110

Filed May 1, 1974, Ser. No. 465,809
Int. Cl. B23p *19/02*
U.S. Cl. 29—259 10 Claims



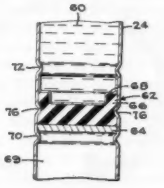
1. A universal-type, pillow-block bearing puller for pulling a pillow-block bearing, whose size can range from small to large, supporting a corresponding size shaft, said pillow-block bearing being caged and swivel-mounted in a pillow block, said bearing puller being adapted for emplaced mounting on the working end of said shaft, said bearing puller in its emplaced mounting relationship remaining co-axial or parallel, and in direct line with the center line of said shaft and pillow-block bearing for pulling and removal of said pillow-block bearing with the fullest of applied force and greatest of ease, and without relative pillow-block-bearing movement during the pulling operation; said bearing puller comprising frame means, coupling means, spacer means, jaw means and jack-screw means; said coupling means being interposed said frame means and said spacer means, jaw means and jack-screw means, said spacer means for bearing against said pillow-block bearing to prevent relative movement of said pillow-block bearing during the pulling operation, said jaw means operatively engaging said pillow block, said jack-screw means being operative to transmit pulling force against the working end of said shaft and to transmit pulling force to said jaw means operatively engaging said pillow block, and said spacer means further maintaining said jack-screw means, co-axial or parallel, and in direct line with the center line of said shaft and pillow-block bearing.

3,883,942

METHOD OF PROVIDING A FLUID TIGHT SEAL BETWEEN A THIN WALLED TUBE AND A PISTON

Arthur A. Fichter, Jr., Saratoga; Ronald D. Danks; Farrell G. Larsen, both of San Jose, and Guy C. Throner, Jr., Saratoga, all of Calif., assignors to FMC Corporation, San Jose, Calif.

Division of Ser. No. 235,274, March 16, 1972, Pat. No. 3,811,381. This application Feb. 8, 1974, Ser. No. 440,946
Int. Cl. B23p *11/02*
U.S. Cl. 29—446 3 Claims



1. A method of providing a fluid tight seal between a thin walled tube and a piston which includes a pair of relatively moving rigid members with a deformable member disposed therebetween comprising the steps of; inserting the piston member into the tube, applying a compressive force to the rigid members to move the rigid members toward each other to radially expand the deformable member against the internal surface of the tube, deforming the tube for releasably locking each of the rigid members in their compressed positions to the tube, and inwardly annularly crimping the walls of the tube against the compressed deformable piston member to radially compress a portion of the deformable piston member to provide a fluid tight seal.

3,883,943

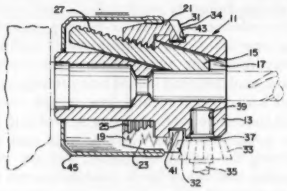
PROCESS OF MANUFACTURING DRILL CHUCKS

William Hugh Dietzen, Fayetteville, N.C., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Nov. 21, 1973, Ser. No. 417,843
Int. Cl. B23p *17/00*
U.S. Cl. 29—413 7 Claims

1. A method of manufacturing drill chucks comprising the steps of forming a hollow chuck nut body, cutting a pair of diametrically opposed, breaking slots in said hollow body, cutting internal threads in said body at a positive and known angular location with respect to said breaking slots, breaking said hollow body at said breaking slots to form a pair of semi-

cylindrical nut parts, assembling said nut parts to a chuck body and chuck jaws subassembly with the threads on said nut



parts engaged with threads on said chuck jaws, and assembling a sleeve over said nut parts.

3,883,944

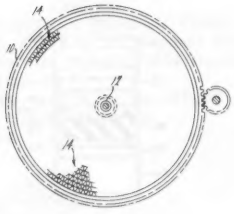
METHOD OF PREPARING OXIDATION RESISTANT MATERIALS AND STRUCTURES

Royal E. Davis, Farmington; Amedee Roy; Claude Belleau, both of Troy, and Gordon E. Allardyce, Dearborn Heights, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 318,785, Dec. 27, 1972, Pat. No. 3,807,030. This application Dec. 20, 1973, Ser. No. 426,867

Int. Cl. B23p *3/00, 19/04*

U.S. Cl. 29—460 **8 Claims**



7. The method of simultaneously diffusion alloying and bonding a matrix assembly made up for the most part of low carbon steel foil by the codiffusion of aluminum and chromium into the assembled steel parts, comprising the steps of: dipping the assembly into a slurry comprised of about 1:1 Al—Fe and Cr powders present in about a 4:5 ratio and suspended in a viscous binder vehicle;

removing excess slurry material from the assembly after withdrawing it from the slurry;

placing the assembly in a sealed diffusion container;

purging the container with argon at a temperature of about 700°–800° F. for a period of about 2 hours to substantially remove the binder vehicle;

cooling the container and contents;

introducing a mixed atmosphere of H_2 and about 1% HF by volume into the container;

causing the gas mixture to circulate through the container for about 15 minutes;

establishing a substantially static atmosphere of the mixture in the container;

heating the container contents to about 2,000° F. at an average rate of about 400°–500° F. per hour and holding the 2,000° F. temperature for about 2 hours after it is reached;

cooling the container and contents to room temperature, purging the container with argon at about 1,000° F. during cool-down, and finally removing loose residue remaining on the core.

3,883,945

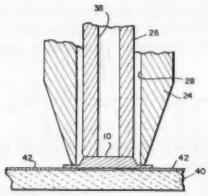
METHOD FOR TRANSFERRING AND JOINING BEAM LEADED CHIPS

George Wallis, Lexington, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Mar. 13, 1974, Ser. No. 450,599

Int. Cl. B23k *19/00;* **H05k** *3/30*

U.S. Cl. 228—176 **3 Claims**



1. A method of transferring semiconductive chips from a backing disc and joining them to a substrate comprising:

A. providing:

a. a heated sleeve

b. a tube slideably carried in a bore of said sleeve,

c. means applying a partial vacuum to said tube, and

B. retrieving said semiconductive chips from said backing disc and joining them to a circuit board by:

a. positioning said sleeve in a line with a chip,

b. advancing said tube beyond an end of said sleeve to engage said chip

c. applying a vacuum pressure to said tube to hold said chip against an end of said tube;

d. transferring said chip to align it with said substrate,

e. retracting said tube to hold said chip against said sleeve, and

f. joining said chip to said substrate.

3,883,946

METHODS OF SECURING A SEMICONDUCTOR BODY TO A SUBSTRATE

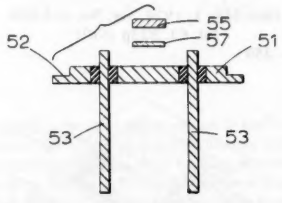
John Robert Dale, Salyfords near Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 13, 1972, Ser. No. 262,342

Claims priority, application United Kingdom, June 17, 1971, 28449/71

Int. Cl. B23k *31/02*

U.S. Cl. 228—121 **33 Claims**



1. A method of forming a bond between a substantially flat surface of a semiconductor body and a substantially flat surface of a substrate via an intermediate layer of soft solder material, said bond having a bond tensile strength of approximately 20 per cent or more of the Ultimate Tensile Strength of said intermediate layer, comprising the steps of:

positioning a malleable metal layer of soft solder material having lead as the primary constituent and a melting point within the range of 300° to 327°C between a flat surface of a semiconductor body and a flat surface of a substrate; and

pressing said semiconductor body and substrate together at a pressure normal to said flat surfaces of between 1 and 5 tons per square inch at a temperature within the range of 240° to 290°C but below the melting point of said malleable metal layer at said pressure and suitably close to but below the lowest temperature at which a liquid phase forms at a surface of said malleable layer at said pressure, said temperature and pressure being maintained for a period sufficient to achieve a bond having a bond tensile strength of approximately 20 percent or more of the Ultimate Tensile Strength of said malleable layer, the maximum period required for such bonding being 30 seconds.

3,883,947

METHOD OF MAKING A THIN FILM ELECTRONIC CIRCUIT UNIT

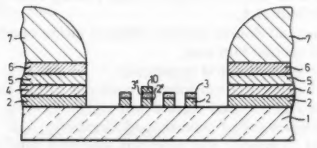
Günter Krüger, Leonberg; Helmut Baum, Stuttgart (Mohringen), and Manfred Widmaier, Leonberg-Eltingen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Division of Ser. No. 302,150, Oct. 30, 1972. This application Jan. 28, 1974, Ser. No. 437,223

Claims priority, application Germany, Nov. 5, 1971, 2155029

Int. Cl. B44d *1/18*; **C23f** *1/02*

U.S. Cl. 29—578 **5 Claims**



1. A method of manufacturing a thin film electronic circuit unit of laminate structure comprising the steps of:

applying a film of valve metal over the entire surface of an insulating substrate;

applying a three-layer metallization film over the entire surface of said film of valve metal by successively sputtering thereon a first layer of copper, an intermediate layer of a diffusion barrier metal and a second layer of copper;

applying a first mask to define the totality of a first and second pattern, said first and said second patterns communicating together in at least one location;

etching said three-layer metallization film and said valve metal film away through gaps of said first mask thereby leaving both said films in said first and second patterns;

removing said first mask;

applying a second mask to protect said second pattern;

etching said three-layer metallization film, but not said valve metal film, of said first pattern with a selective etchant to expose said valve metal film of said first pattern;

partially oxidizing anodically said valve metal film of said first pattern, and thereafter removing said second mask; and

dipping the surface of said substrate which bears the aforesaid films and patterns in liquid lead-tin solder, said solder adhering, as the result of such dipping, to the three-layer metallization film of said second pattern but not adhering to said oxidized valve metal film nor to said substrate.

3,883,948

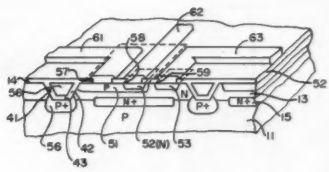
SEMICONDUCTOR STRUCTURE AND METHOD

David F. Allison, Los Altos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Jan. 2, 1974, Ser. No. 429,933

Int. Cl. B01j *17/00*

U.S. Cl. 29—577 **7 Claims**



1. In a method for forming a semiconductor structure, providing a semiconductor body having an impurity of one conductivity type therein and having a major surface lying in a <100> plane, providing an etch resistant mask on said surface and having a predetermined pattern of openings for moats formed therein, bringing an anisotropic etch into contact with the portions of said surfaces lying in the <100> plane exposed by the mask to form moats in the semiconductor body having side walls lying in a plane different from the <100> plane and at said surface defining spaced islands, said side walls defining the moats extending downwardly into the semiconductor body until they join each other to form moats which are substantially V-shaped in cross section, forming protective layers upon said side walls defining the moats, etching away portions of the protective layers in the moats so that the portions of the protective layers at the apex of the moats are removed and the thickness of the protective layers on the side walls is reduced, causing an impurity of said one conductivity type to enter the semiconductor body through the apexes of the moats to form regions of said one impurity of one conductivity type of greater concentration than that of the semiconductor body extending downwardly from the layers of the moats, forming protective layers in the apexes of the moats and adjoining the protective layers on the side walls of the moats, filling the moats with a filling material, forming devices in said islands, providing protective layers overlying said islands and adjoining the protective layers in the moats and forming leads on said layers of protective material extending through said layers of protective material to make contact with said devices in said islands and interconnecting the devices with the devices in other islands.

3,883,949

REED SWITCH MANUFACTURE

John Hill, Bickley, and Henryk Turczanski, Beckenham, both of England, assignors to Comtelco (U.K.) Limited, Tonbridge, Kent, England

Filed Dec. 11, 1973, Ser. No. 423,735

Claims priority, application United Kingdom, Feb. 6, 1973, 5839/73

Int. Cl. B23p *17/00*

U.S. Cl. 29—622 **11 Claims**

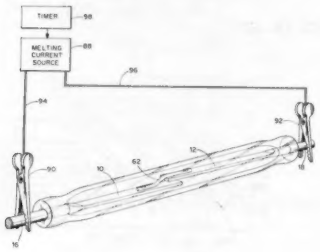
1. A method for precisely positioning a pair of coacting conductive switch contacts within a sealed enclosure comprising the steps of:

disposing said contacts in a fixed predetermined spatial relationship;

rigidly joining said contacts with an electrically conductive meltable connection while in said fixed predetermined spatial relationship;

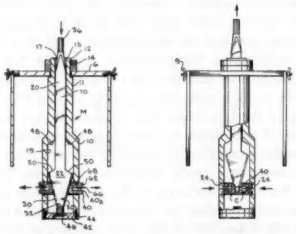
sealing said contacts while joined as aforesaid within an

enclosure whereby said rigid connection retains said contacts in said predetermined spatial relationship; and



eliminating said connection between said contacts by melting said rigid connection within said enclosure.

3,883,950
INSIDE PIPECUTTER
Arthur L. Kurtz, 4202 Little Berry, Houston, Tex. 77018
Filed June 28, 1973, Ser. No. 374,523
Int. Cl. B23d *21/08, 21/14;* **B26d** *3/16*
U.S. Cl. 30—106 **5 Claims**



1. An inside pipecutter for cutting off plastic pipe encased in concrete at some desired elevation above or below the upper surface of the concrete comprising:

a. a rotatable mandrel adapted to be inserted into the upper open end of a section of plastic pipe embedded in concrete and protruding above the upper surface of such concrete;

b. guide means for supporting said rotatable mandrel adjacent its upper end with its lower end in the pipe, said guide means including a plurality of adjustable legs for supporting said mandrel at a desired elevation relative to the upper surface of the concrete;

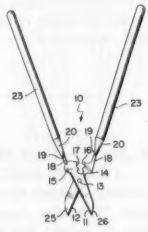
c. cutter means carried by said rotatable mandrel and movable radially outwardly beyond the outer circumference of said mandrel and into engagement with the inner surface of the plastic pipe for cutting same;

d. means for rotating said mandrel;

e. drive means for urging said cutter means radially outwardly for cutting the pipe upon rotation of said mandrel, said drive means including a wedge shaped drive means; and

f. adjustable stop means in said mandrel for limiting downward movement of said wedge shaped drive means, said stop means being mounted for adjustment from the exterior of said mandrel.

3,883,951
LONG HANDLED SHEARS
Theodore Farrell, Pomona, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y.
Filed Aug. 7, 1974, Ser. No. 495,442
Int. Cl. B26b *13/08*
U.S. Cl. 30—226 **10 Claims**



1. A long handled shears, which comprises:

a. a straight edge jaw;

b. a straight edge cutting blade;

c. said straight edge jaw pivotally mounted in a crossed scissor type assembly to said straight edge cutting blade with a stationary fulcrum pin;

d. a geometrically shaped butt end of said straight edge jaw;

e. a second geometrically shaped butt end of said straight edge cutting blade;

f. a double concave shaped inside cutting edge of said second butt end;

g. a second double concave shaped inside cutting edge of said second butt end;

h. two elongated rod members;

i. said elongated rod members affixed to the ends of said butt end and said second butt end;

j. two open ended cone shaped members;

k. said elongated rod members mounted into an opened apex end of each said cone shaped member;

l. an inside bottom base periphery of each said cone shaped member;

m. two elongated handles;

n. a means of attaching each said elongated handle to said inside bottom base periphery of each said cone shaped member;

o. said straight edge jaw tapered to a pointed outer end; p. said straight edge cutting blade tapered to a second pointed outer end;

q. said straight edge jaw beveled below said stationary fulcrum pin at an obtuse angle to a longitudinal axis of said butt end; and

r. said straight edge cutting blade beveled below said stationary fulcrum pin at an obtuse angle to a second longitudinal axis of said second butt end.

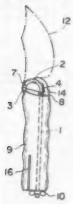
3,883,952
HIDE SPLITTING AND GUTTING DEVICE
Blaz Strovas, Borger, Tex., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed May 14, 1974, Ser. No. 469,648
Int. Cl. B26b *5/00*
U.S. Cl. 30—299 **3 Claims**

1. A hide splitting and gutting device, comprising

a rod-like shaft having an arcuate head of substantially semicircular configuration with a free end substantially diametrically opposite another end on the shaft and a slot formed therethrough from substantially one end to the other in a plane substantially perpendicular to the central axis of the arcuate head;

a handle removably affixed to the shaft around the shaft and free from the arcuate head;

a skinning blade removably affixed to the arcuate head of the shaft and extending through the slot therethrough



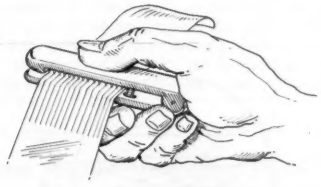
substantially coaxially with and away from the shaft; and a hide splitting blade removably affixed to the arcuate head of the shaft and extending substantially diametrically between the ends of the arcuate head.

3,883,953

DECORATIVE RIBBON SHREDDER

James W. Saullo, Forest Ave. Ext., Jamestown, N.Y. 14701; William L. Fehlman, 168 Work St., Falconer, N.Y. 14733, and Harry W. Grosser, 1309 Forest Ave. Ext., Jamestown, N.Y. 14701

Filed Mar. 8, 1973, Ser. No. 339,427
Int. Cl. B26b *3/04*
U.S. Cl. 30—304 **4 Claims**



1. A hand operated tool for the purpose of stranding or shredding decorative ribbon, such as used on gift packages and the like,

said tool having a first jaw and a second jaw,

means swingably connecting said jaws together to swing relative to each other about a lateral axis,

teeth fixed to one of said jaws,

said teeth being pointed and arranged in a longitudinal row generally perpendicular to said axis about which said jaws swing,

said teeth terminating in spaced points,

said points being adapted to penetrate a ribbon disposed between said jaws and to engage the jaw adjacent said points to cause said ribbon to curl and fluff up, thus making it more attractive, this being accomplished by pulling said ribbon through said tool,

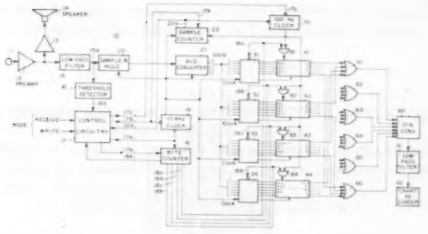
a post is fixed to one said jaw and said post is slidably received in an opening in the other said jaw whereby said post will act as a stop when said ribbon enters said tool and also serves as a spring retainer, holding the spring required to force said jaws apart after said ribbon has been pulled through, and will also act as a stop to keep said jaws from spreading too far open after said ribbon has been pulled through.

3,883,954

METHOD AND APPARATUS FOR RECORDING OCCLUSAL VIBRATIONS

Lawrence R. Simmering, Cinnaminson; Thomas B. Martin, Delran, and Marvin B. Herscher, Cherry Hill, all of N.J., assignors to Threshold Technology Inc., Cinnaminson, N.J.

Filed July 30, 1973, Ser. No. 383,900
Int. Cl. A61c *9/00*
U.S. Cl. 32—19 **8 Claims**



1. Apparatus for producing a viewable display of the acoustic vibrations resulting from an act of dental occlusion, comprising:

transducer means for generating an electrical signal representative of vibrations from oral occlusion;

threshold detection means responsive to said electrical signal for generating an enable signal when said electrical signal exceeds a predetermined threshold condition;

digitizing means responsive to said enable signal for sampling said electrical signal at a first clock rate and generating digital representations of said signal;

means for storing said digital representations;

means for reading out the stored digital representations at a second lower clock rate;

means for converting the read out digital signals to analog signals; and

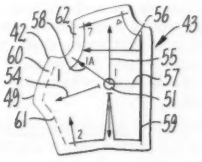
means for displaying said analog signals.

3,883,955

PATTERN FITTING TOOL AND METHOD OF CUSTOM FITTING PATTERNS

Roberta F. Bush, 232 Sierra Dr., Walnut Creek, Calif. 94596

Filed June 11, 1969, Ser. No. 832,043
Int. Cl. A41h *3/00*
U.S. Cl. 33—12 **5 Claims**



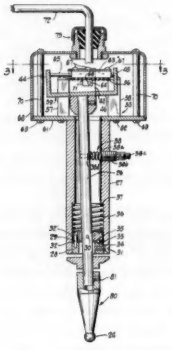
1. A plastic pattern tool for providing customized fitting suitable for fitting a female figure comprising plastic sheet material having basic pattern areas indicating a bodice front, bodice back, skirt front, skirt back and sleeve, said pattern having fixed reference markings indicating the position for the bust, seat, and elbow, and containing numbers thereon locating areas which may require pattern changes to fit unusual figures and bring the pattern changes within the main body of the pattern whereby three dimensional changes may be made throughout the pattern area, and in which the patterns contain a plurality of correctable markings indicating areas for locating darts and seams.

3,883,956

PROPORTIONAL CONTROL FOR GUIDANCE SYSTEM

Abraham Zeewy, University Heights, and Donald Geringer, Parma, both of Ohio, assignors to Cecil Equipment Co., Inc., Medina, Ohio

Filed Dec. 26, 1972, Ser. No. 318,493
Int. Cl. G01b 7/28
U.S. Cl. 33—23 K 18 Claims



1. A probe for detecting the direction and its rate of change of an elevation upon a surface in motion with respect to the probe, comprising:

a body,

a probe shaft carried within said body and having a longitudinal axis with a surface portion at the end thereof, said probe shaft being pivotable in all directions about a point eccentric of said axis by one or more forces acting upon said surface contacting portion,

means for presenting continuous variable electrical resistance changeable by said pivoting of said probe shaft, thereby presenting a resistance change proportional to said pivoting of said probe shaft, and rotatable to the direction and its rate of change of said elevation with respect to the direction of motion between said probe and said elevation.

3,883,957

DIRECTIONAL GYRO INDICATOR SYSTEM

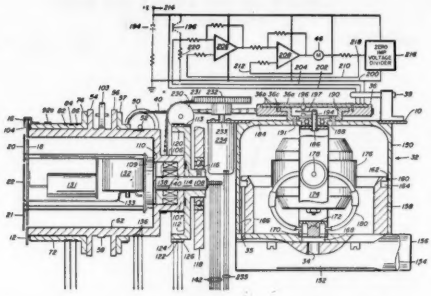
James R. Youkin, Fayetteville, Ark., assignor to Edo-Aire Mitchell Industries, Inc., Mineral Wells, Tex.

Continuation-in-part of Ser. No. 240,382, April 3, 1972. This application Aug. 21, 1973, Ser. No. 389,622
Int. Cl. G01c 19/34
U.S. Cl. 33—318 11 Claims

1. In an aircraft display including a generally horizontal barrel having a heading card and a bearing supporting the barrel at the rear end thereof for rotation about the axis of the barrel, the improvement comprising:

a single roller rotatable about a fixed axis and disposed underneath the barrel to rotatably support the barrel,

a pair of rollers spaced apart on the upper portion of the barrel for rotatable support of the barrel, and



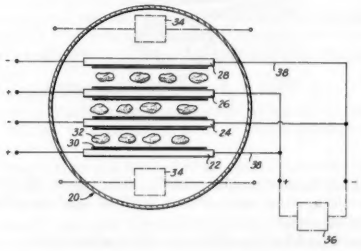
means for adjusting the relative position of said pair of rollers in order to enable centering of the heading card.

3,883,958

METHOD AND APPARATUS FOR ACCELERATED FREEZE DRYING

Antonio Domingos Filipe, Avenida Almirante Gago Coutinho, 3-3°, Libson, Portugal

Filed Jan. 14, 1974, Ser. No. 433,282
Claims priority, application Portugal, Mar. 10, 1973, 59498
Int. Cl. F26b 5/06
U.S. Cl. 34—5 26 Claims

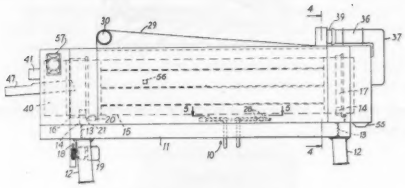


1. In a process for freeze drying a food product, the steps of situating the food product while it is in a frozen condition in an evacuated chamber between a pair of capacitor electrodes for utilizing the food product as a dielectric between said electrodes, initially exposing the latter food product, while it is situated between said capacitor electrodes, to the heat of infrared rays for extracting water from the food product by sublimation and evaporation, and after initially exposing the food product to the heat of the infrared rays for a given length of time and while continuing the exposure of the food product to the infrared rays, electrically energizing said electrodes in a manner producing between the electrodes the energy of a radio frequency field which is transformed into thermal energy by dielectric losses which occur in the interior of the food product for heating the food product simultaneously with infrared radiation and with said thermal energy resulting from dielectric losses, only after initial heating with the infrared rays for said given length of time.

3,883,959
GAS HEATED ROTARY DRIER

Richard E. G. Neville, Salisbury, England, assignor to AMF Incorporated, White Plains, N.Y.

Division of Ser. No. 379,743, July 16, 1973. This application July 12, 1974, Ser. No. 488,617
Int. Cl. F26b *19/00*
U.S. Cl. 34—48 **6 Claims**



1. A rotary drier for particulate or loose material comprising a cylinder arranged to rotate about its axis inclinded to the horizontal, said cylinder having formed along its cylindrical surface a plurality of hollow paddles extending axially along said cylinder and inwardly thereof, the interior of said paddles communicating with the exterior of the cylinder, at least one gas burner arranged below the cylinder to direct flame into the interior of the hollow paddles, said cylinder being surrounded along its length by a cylindrical wall defining a combustion space between said cylinder adn said wall communicating with the interior of said paddles and the bottom therof being open to said burner, the top of the combustion space including a tapered flue gas collection manifold which communicates with a flue duct for removing waste combustion gases, means for introducing air into said cylinder, said means comprising a passageway for conducting ambient air around said cylinder to preheat the air and for separating the ambient air from combustion gases, a fan for drawing air theough said passageway and ducting for the preheated air to the interior of said cylinder, an inlet probe for introducing preheated air into said cylinder at a position intermediate its ends, and means for measuring and controlling the temperature of tobacco within said cylinder.

3,883,960
DRYING MACHINE FOR TEXTILE FABRIC WEBS

Hans Stang, Birkenweg 13, 555 Bernkastel-Kues, Germany

Continuation-in-part of Ser. No. 208,713, Dec. 16, 1971. This application Dec. 11, 1973, Ser. No. 423,763
Int. Cl. F26b *13/12*
U.S. Cl. 34—153 **7 Claims**

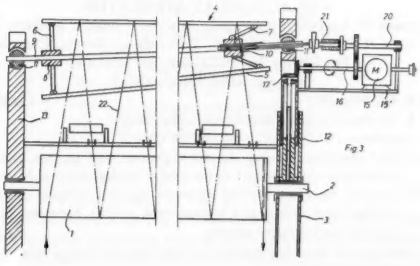


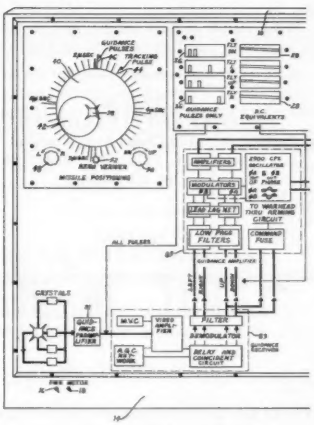
Fig.3

1. A drying machine for shrinking or stretching bands of textile fabric including a drying cylinder and a guide roller spaced from such cylinder, the band being spirally wound around the remote peripheral portions of the cylinder and roller and tensioned therebetween, the guide roller having an axle and a plurality of rods arranged in equiangularly spaced radial planes of said axle forming a guide roller periphery, characterized by a hub carried by the axle and being displaceable axially of the axle, a plurality of struts pivotably connected to said hub and projecting therefrom substantially radially of the axle and forming an angle of projection with the axis of the axle, each of the rods being pivotably connected to one of said struts, said struts being variable in effective length radially of the axle, and means for varying the effective length of said struts and thereby varying the diameter of said guide roller periphery including means for displacing said hub along the axle for changing the angle of projection of said struts and thereby varying the diameter of said guide roller periphery.

3,883,961
GUIDANCE AND CONTROL SYSTEMS DEMONSTRATOR FOR A GUIDED MISSILE

Charles A. Limouze, Dearborn, Mich., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 14, 1956, Ser. No. 628,470
Int. Cl. G09b *9/00*
U.S. Cl. 35—10.4 **12 Claims**

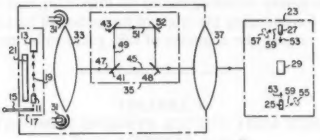


1. A functional systems demonstrator for a guided missile of the type having stabilizer wings, control wings and an electronic system for the reception of radiated guidance intelligence and the production and conversion of error signals to control signals comprising, in combination: a support structure including a panel; first means carried on said panel visually demonstrating the derivation of guidance signals by said guided missile; second means carried on said panel and connected with said first means visually demonstrating the production of error signals commensurate with deviations of said missile from a predetermined orientation in a frame of reference; third means carried on said panel visually demonstrating the conversion of said error signals into control signals, and fourth means carried on said panel visually demonstrating the correction of the orientation of the guided missile in response to said control signals.

3,883,962
DETECTION OF ABSENCE OF CONCENTRATION AND COHERENCE IN A SUBJECT

Horst Kunig, R.D. No. 1, Saltsburg, Pa. 15681

Division of Ser. No. 321,689, Jan. 8, 1973, Pat. No. 3,833,083.
This application June 19, 1974, Ser. No. 480,700
Int. Cl. B60k *27/08*; **G09b** *19/00*
U.S. Cl. 35—22 R **7 Claims**

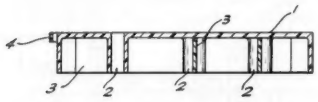


1. Apparatus for detecting absence both of concentration and of coherence in a subject comprising a first object moveable, and to be moved by said subject over a predetermined path, from a first position to a second position, a second object substantially hidden from the direct view of the subject, said second object being disposed at said second position, said first object being moveable over a path permitting substantial deviation of said first object from direct movement over said predetermined path to said second object, and means for producing a visual image of said first and second objects showing the said movement of said first object, the said visual image being visible to said subject and serving to aid said subject in moving said first object to said second object.

3,883,963
SPIKE AND CLEAT GUARD

Robert Barbito, Sr., 1426 Chalet Ave., Anaheim, Calif. 92802

Filed Apr. 1, 1974, Ser. No. 457,061
Int. Cl. A43b
U.S. Cl. 36—2.5 AN **3 Claims**



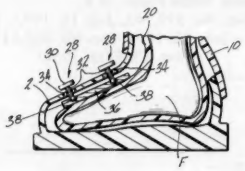
1. A spike guard comprising a sole supporting plate containing four or more female bosses, means for securing said plate in contact with the underside of a shoe containing spikes and adapted so that the said spikes become inserted inside said bosses and said plate is on the underside of said shoe.

3,883,964
SKI BOOT WITH ADJUSTABLE INSTEP PLATE

Donald R. Check, Glastonbury, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed July 5, 1974, Ser. No. 486,267
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5 AL **6 Claims**

1. A ski boot comprising an outer shell of relatively flexible material, said outer shell having an instep portion being formed as an unitary member; a plate member disposed within said boot inwardly of said instep portion, said plate member being positioned to overlie the instep of a foot disposed in said boot; and adjustment means extending through said instep portion of said boot shell, said adjustment means engaging said plate and being operative to move said plate toward and away from the instep of a foot disposed in said boot to vary the tightness of fit of said boot on the foot, and said adjustment means being manipulatable from the exterior of said boot to

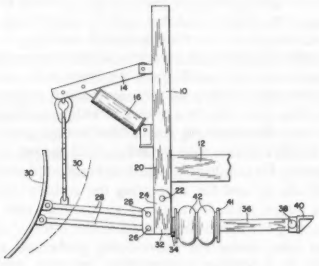


permit tightness adjustment without removing the foot from said boot.

3,883,965
SNOW PLOW FRAME

Real J. Poirier, Sr., and Real J. Poirier, Jr., both of 5 Bridges Rd., Brimfield, Mass. 01010

Filed Oct. 9, 1973, Ser. No. 404,593
Int. Cl. A01b *61/04*
U.S. Cl. 37—42 R **8 Claims**



1. A snow plow and a snow plow frame for a vehicle, comprising a bracket pivoted on the frame, means mounting the snow plow on the pivoted bracket, the pivot axis of said bracket being horizontal and transverse of vehicle, direction and fielding, resilient air bag means resisting motion of the bracket in a rearward direction under impact from an obstruction encountered by the plow, the resilient means yielding to allow the plow to relatively yield from the obstruction.

3,883,966
VISUAL DISPLAY APPARATUS

Vernon A. Ludwig, Edmonton, Alberta, Canada, assignor to Valmat Signs & Signals Ltd., Edmonton, Alberta, Canada

Filed Sept. 26, 1973, Ser. No. 400,841
Int. Cl. G09f *11/00*, *19/14*
U.S. Cl. 40—36 **4 Claims**

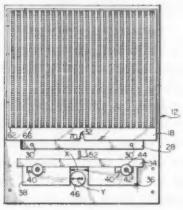
1. A visual display apparatus comprising:
a substantially planar, upstanding base;
a first member having stripes thereon, said stripes being alternately of a design color and a background color;
a second member having thereon spaced stripes of the background color and transparent spaces between said spaced background stripes;
said second member further having thereon design information comprising
a plurality of spaced design colored stripes located in some of said transparent spaces, and
a plurality of spaced transparent portions located in some of said background stripes;
means, coupled to said base, for supporting said first and second members at a lower portion of said base and

adjacent each other in overlying, upstanding arrangement for relative movement; and

means for moving said members relative to each other between a first position wherein the design colored stripes of the first member are aligned with the design colored strips on the second number and a second position wherein the design colored stripes of the first member are between the design colored stripes of the second member so that in the first position no message is displayed but in the second position a message is clearly displayed,

said means for supporting said first and second members including

a first bar rigidly connected in substantially horizontal position to said base and upon which the bottom edge of said first member rests,



a second bar connected in substantially horizontal position to said base for translational movement and upon which the bottom edge of said second member rests, the lower of said bars porjecting forwardly of said base a distance greater than the upper one of said bars,

a pin extending outwarldy from said base at a position above said first bar, said first member having a slot extending inward from the bottom edge thereof for the reception of said pin, and

an arm rigidly connected to said second bar and extending upwardly therefrom, said second member having a slot extending inward from the bottom edge thereof for the reception of said arm.

3,883,967

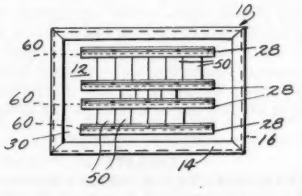
SIGN WITH CHANGEABLE CHARACTER PLATES

Guy W. Barnes, 1005 S. 48th Ave., Yakima, Wash. 98902

Filed Sept. 10, 1971, Ser. No. 179,430

Int. Cl. G09f *11/30*

U.S. Cl. 40—65 **14 Claims**



1. A sign for displaying at least one horizontal row of character plates in a manner such that the character plates can be installed, removed and replaced by authorized persons, said sign comprising:

a sign backing member having at least one face;

at least two channel members secured on the backing member, one above the other so the channel members proceed horizontally across said face parallel to one another and terminating adjacent the opposite sides of said backing member;

the lower channel member having means defining an upwardly opening groove extending therealong, said groove having means defining a lip along the upper extent thereof, said lip being spaced from said face of the backing member by a distance at least equal to the thickness of a character plate adjacent the lower edge of the character plate;

the upper channel member having means defining a downwardly opening groove extending therealong, said groove having means defining a lip along the lower extent thereof, said lip being spaced from said face of the backing member by a distance at least equal to the thickness of a character plate adjacent the upper edge of the character plate;

means defining a longitudinally extending ledge within said downwardly opening groove intermediate the height of that groove, said ledge partly constricting said downwardly opening groove but leaving a gap between itself and said face of the backing member at least equal in thickness to the thickness of a character plate adjacent the upper edge of the character plate; said ledge thereby defining a compartment thereabove within said downwardly opening groove;

the distance between the upper and lower channel members being such that a character plate cannot be frontally installed and removed unless the upper edge thereof is permitted to temporarily pass said ledge and enter said compartment so the lower edge of the character plate can clear said lip of the upwardly opening groove;

and a flexible locking strip longitudinally, slidably received in said compartment, said locking strip being thicker than said gap, and said locking strip, when disposed within said compartment obstructing the compartment sufficiently to prevent character plate upper edges from passing said ledge and entering said compartment to an extent sufficient to permit the lower edges of the character plates to clear said lip of the upwardly opening groove, so that character plates may neither be frontally installed nor frontally removed when the locking strip is disposed within the compartment.

3,883,968

DIGITAL DISPLAY APPARATUS

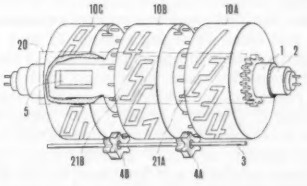
Tomokazu Suzuki, Tokyo, Japan, assignor to Tamura Electric Works, Ltd., Tokyo, Japan

Filed Feb. 14, 1974, Ser. No. 442,618

Claims priority, application Japan, Mar. 29, 1973, 48-38013

Int. Cl. G09f *11/02*

U.S. Cl. 40—77.8 **2 Claims**



1. In a digital display apparatus of the type having a plurality of display drums, each of said display drums being provided with a plurality of display digits impressed one below the other around the peripheral surface thereof, said drums being loosely mounted on a shaft, means whereby the rotation of a display drum of a lower order of magnitude is transmitted to another display drum of an upper order of magnitude through shift pinions interposed between adjacent display drums, the improvement wherein the display digits on each display drum are substantially equal sized, discrete and inclined in the same direction and by the same angle from a plane perpendicular to

the central axis of said shaft such that a substantial portion of the lower portion of one display digit and a substantial portion of the upper portion of a sub-adjacent display digit are adjacent to each other along the axial direction of said shaft and wherein a front plate is provided in front of said display drums, said front plate being provided with a plurality of apertures or read windows equal in number to said plurality of display drums, each of said windows being so shaped as to expose only one display digit of its associated display drum, whereby the drum diameter can be reduced without a corresponding reduction in display digit size.

3,883,969

ANIMATED SURFACE DISPLAY DEVICE

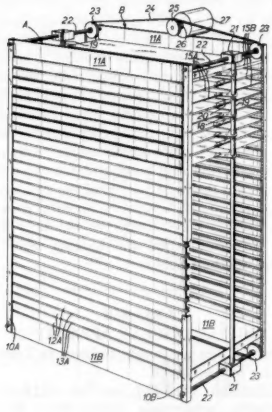
Bernard Albert Amouriq, 27 Chambines, France

Filed June 28, 1972, Ser. No. 267,234

Claims priority, application France, June 29, 1971, 71.23590

Int. Cl. G09f *11/21*

U.S. Cl. 40—106.52 **10 Claims**



1. A display device comprising a plurality of separate facets juxtaposed in a first plane and forming an animated surface therein, said facets belonging individually to a plurality of quadrangular flexible sheets, a first plurality of guiding means disposed in said first plane and having a width not more than about 1 centimeter and a length not less than about 1 meter, each of said flexible sheets passing over one of said guiding means in the shape of a U and thus forming two parallel sides, a second plurality of second guiding means disposed in a second plane parallel to said first plane, the two sides of each said flexible sheet being coupled to each other by flexible linking means passing over one of said second guiding means in the shape of a U, and driving means connected to said flexible sheets at the rear of their guiding means and enabling said flexible sheets to effect a sliding movement on their respective guiding means, the said driving means being coupled to said flexible sheets by a plurality of lateral connectors fixed only to the corners of one side, the end of each said side of each flexible sheet being wholly free from any connection between its two corners, whereby each said connector pulls obliquely on only the corner of a corresponding flexble sheet, thereby to achieve very high definition of the display obtained by reducing the width of said facets relative to their length.

3,883,970

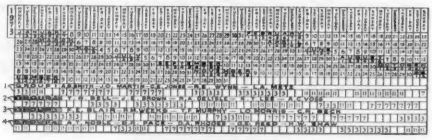
WORK-SHIFT INDICATOR

Leonard Earl Campbell, Jr., 460 56th Ave., Meridian, Miss. 39301

Continuation of Ser. No. 304,715, Nov. 8, 1972, abandoned. This application Dec. 14, 1973, Ser. No. 424,857

Int. Cl. G09d *1/00*

U.S. Cl. 40—110 **5 Claims**



1. A work-shift indicator, comprising:

a thin rectangular sheet of stiffly flexible material, capable of being marked with symbols;

calendar-like indicia on said sheet of the months, dates and days of the weeks of a given period, comprising a number of swing-shift cycles, the said calendar-like indicia being on both sides of said sheet and in a number of successive spaces equal to the number of days in said period, arranged in parallel lines and comprising a plurality of sets of date symbols, each of said sets being equal in number of symbols to the number of days in a swing-shift cycle and ending with an end of one of said parallel lines; and an endless ribbon of flexible material, encompassing and in contact with said sheet, slidably and turnably mounted on and between two opposite edges of said sheet, having substantially the same width throughout its length and all around said sheet, and having an encompassing length substantially equal to twice the sum of the distance between said edges and the thickness of said thin sheet and sufficient clearance to allow sliding of the band on the sheet; the said band comprising an additional set of symbols indicating worker groups of said swing-shift cycles, spaced along the length of the ribbon, and comprising groups of successive figures indicating work-shift starting hours, spaced along the length of the ribbon, the said figure groups being separated from each other by off-duty spaces indicating days off of the said groups; part of the said successive figures being in a line on one side of said sheet and the other part of said successive figures being in a line on the other side of said sheet; the said figures and off-duty spaces also being in perpendicular lines that are normal to said parallel lines of the calendar-like indicia, each of the said perpendicular lines for each of the starting-hour figures and off-duty spaces in one adjusted position of said endless ribbon orthogonally intersecting a said parallel line of calendar-like indicia at an indicium indicating the day of said starting-hour figure or off-duty day of one of said groups, and in another, turned position of the ribbon indicating the day of said starting-hour figure or off-duty day of another of said groups.

3,883,971

YEAR-AT-A-GLANCE MEMO CALENDAR

Jean S. Weiss, 4147 S.W. 11th St., Miami, Fla. 33134

Filed Nov. 12, 1973, Ser. No. 415,236

Int. Cl. G09d *3/04*

U.S. Cl. 40—119 **1 Claim**

1. A calendar comprising in combination:

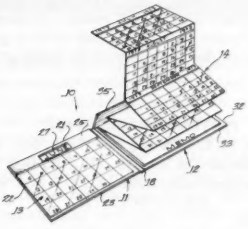
a substantially flat rectangularly shaped back cover having a top edge, a bottom edge, an outermost end, an innermost end, an interior surface, and an exterior surface;

a lip portion integrally formed with the back cover and extending along the back cover top edge and bent over onto itself in juxtaposition with the top portion of the cover interior surface to define a flap extending com-

pletely therealong having a terminal edge pointing in the direction of the cover bottom edge;

a substantially flat rectangularly shaped front cover of a size and configuration approximately equal to the size and configuration of the back cover, the front cover having a top edge, a bottom edge, an outermost end, an innermost end, an interior surface, and an exterior surface;

a lip portion integrally formed with the front cover and extending along the front cover top edge and bent over onto itself to be in juxtaposition with the top portion of the front cover interior surface with the terminal edge pointing in the direction of the front cover bottom end in a manner to define a flap extending completely along the top edge of the front cover;



the inner end of the front cover being hingedly connected to the inner adjacent end of the back cover with the front cover swingable thereabout between a closed portion overlying the back cover with the interior surfaces of the back cover and front cover disposed in confronting relationship and an open position where the front cover and back cover are co-planar;

a pair of elongated rectangular sheets of paper each of the same length and width and each having imprinted on the face surface thereof a series of six calendar months in succession theredown from the top end to the bottom end of the face surface;

the first sheet containing the name and days of the months of January through June;

the second sheet containing the name and days of the months of July through December;

each month extending the full width of its associated sheet and approximately one-sixth the length thereof with the size of each month defining portion not exceeding the width and height of the respective covers;

a plurality of longitudinally spaced transversely extending fold lines disposed on each sheet and which are positioned intermediate the junction of the sequential months printed on the sheet such that the month defining portions on each sheet may be folded over upon each other in a variety of different ways utilizing such fold lines so that a desired month defining portion of each sheet may rest on the top of the folded sheet;

the top edge of the first sheet adapted to be placed in its folded condition beneath the flap of the front cover and held in position thereby such that the desired month indicia is visibly displayed on such cover when the covers are in the open position;

the top edge of the second sheet adapted to be placed in its folded condition beneath the flap of the back cover and held in position thereby such that the desired month is visibly displayed on such cover when the covers are in the open position;

an elongated rectangular aperture disposed centrally of the front cover flap and extending transversely therethrough; an elongated rectangular aperture disposed centrally of the back cover flap and extending transversely therethrough in a position to register with the front cover aperture when the front cover is folded about the hinge to overlie the back cover;

each of the month indicia defining portions of each of the sheets having at the top central portion thereof the name of the month for which the portion is intended;

the name of the month of the month defining portion laying topmost on the folded sheets when the same are inserted beneath the associated flap registering with the associated flap aperture for visibility of the month exteriorly of the flap, with the days of the corresponding month being visible below the associated flap;

the back cover and front cover each being manufactured of a heavy guage cardboard covered with a wood grain paper material;

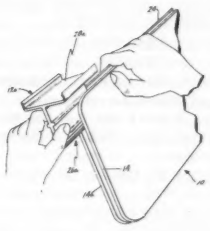
and the hinge interconnecting the inner end of the front cover to the adjacent inner end of the back cover comprising a cloth material extending the complete length of the inner ends and secured thereto.

3,883,972

UNIVERSAL MOUNTING FOR VARIOUS SIGNAGE

Robert L. Propst, Ann Arbor; William E. Stumpf, Zeeland, and Michael A. Wodka, Ypsilanti, all of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Oct. 3, 1972, Ser. No. 294,657
Int. Cl. G09f *7/22*
U.S. Cl. 40—128 **24 Claims**



1. A display assembly comprising, in combination: a sign having front and rear panels spaced from each other by a spacer element, said element being recessed from the outer margins of said panels, said spacer element including means defining a keeper; and an adapter having a first portion defining a tongue means cooperatively engageable with said keeper to rigidly connect said adapter to said sign, and a second portion cooperable with a support to anchor said adapter and sign to the support, said tongue means further including one or more raised portions on each side, said raised portions abutting the inner surfaces of said panels between said spacer element and the outer margin of said panels to provide lateral supportive stability of said sign and spacer to said adapter.

3,883,973

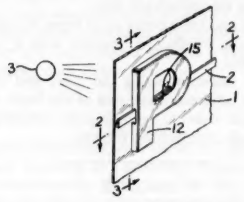
SIGN

Jack Goodman, 5540 W. Harrison St., Chicago, Ill. 60604

Filed Jan. 12, 1971, Ser. No. 105,907
Int. Cl. G09f *7/02*
U.S. Cl. 40—142 **1 Claim**

1. A sign having a horizontal letter supporting rail, a letter for said rail, said letter having an L shaped mounting slot across the back thereof for the full width of the letter, with the horizontal portion of the L of the slot opening at and facing the rear of the letter and communicating with the vertical portion of the slot which is located forwardly at the rear end of the letter to define a stem between the rear edge of the vertical portion of the slot and the rear edge of the letter, the distance between the bottom of the stem and the bottom of the horizontal portion of the slot being sufficient to permit the mounting of the letter in a vertical position in front of the letter-supporting sign rail with the slot straddling the base and the top of the rail, and with the stem of the letter in a position

at the rear of the rail, and to permit lowering of the letter onto the rail to bring the opposite sides of those parts of the letter that define the vertical portion of the L shaped slot into positions on opposite sides of the rail, at least one of the opposite sides of the vertical portion of the L of the slot bearing against the side of the rail to restrict upward movement of the letter

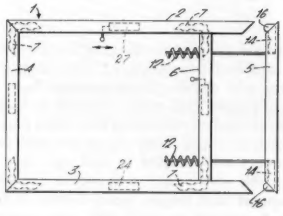


from the rail to a vertical direction, the slot being wedge shaped in a direction from the rear toward the front of the letter to cause the slot portion of the letter to wedge with the rail as the letter reaches its lowermost position, and the center of the mounting slot from the top to the bottom thereof being approximately midway between the top and the bottom of the letter.

3,883,974
FRAMES

Christopher John Ashton, Barnet, England, assignor to Marler Haley ExpoSystems Limited, Barnet, England

Filed Nov. 7, 1973, Ser. No. 406,401
Claims priority, application United Kingdom, May 24, 1973, 24873/73
Int. Cl. G09f *1/12*
U.S. Cl. 40—152 **8 Claims**

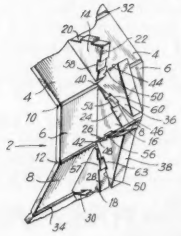


1. A frame for a display means, such as a picture, poster, display panel or the like, comprising a first pair of channel-shaped elongate members forming sides which are substantially parallel one to the other and a second pair of elongate channel-shaped members forming sides which are substantially parallel one to the other and extend at right angles to the first pair of said elongate members, each of said elongate members having four substantially parallel and spaced apart wall means whereby three parallel grooves are defined, an internal pair of said wall means having downwardly inclined lips at their free edges, and wherein there is means adapted to allow one of said elongate members to be demountable from but remaining secured to the remaining elongate members of said frame, said means comprising an intermediate channel-shaped member having walls with downwardly inclined lips at their free edges, said walls defining a groove with a width corresponding to the width of the middle groove of said first and second pairs of elongate members, said intermediate member being positioned to lie between and parallel to the elongate members of one of said pairs of elongate members and nearer to said one of said elongate members than the other, and resilient means coacting between said intermediate member and said nearer one of said elongate members for urging said nearer one of said elongate members towards said remaining elongate members of said frame, said remaining elongate members of said frame and said intermediate member being secured together by L-shaped clips which are received in said grooves, said demountable one of the elongate members having locating means protruding from the ends thereof for being received in said grooves, said locating means and said resilient means being adapted to allow movement of said one elongate member between a first position in which the locating means is received in the grooves and the frame is complete and a second position in which said one elongate member has been moved away from said intermediate member against the force of said resilient means to allow the locating means to be removed from said grooves, and said urging means permitting said one elongate member to be moved laterally with respect to the plane of the frame when said one elongate member is in said second position to allow access of a display means to one of the outer pair of three grooves and then to the other of the outer pair of the three grooves.

3,883,975
PICTURE FRAME STRIP

Robert Mentken, 51 E. 97th St., New York, N.Y. 10029

Continuation-in-part of Ser. No. 311,552, Dec. 1, 1972, abandoned. This application June 26, 1974, Ser. No. 483,162
Int. Cl. G09f *1/12*
U.S. Cl. 40—155 **12 Claims**



1. A picture-frame strip for framing pictures comprising in combination a plurality of members flexibly connected together, each member having a respectively similarly positioned and aligned second member projecting at a right angle from one side thereof, all said second members being aligned in the same plane and each having surfaces defined at least in part along lines extending from the points where the flexibly connected members are joined, inwardly, in the direction of the center of said second member, at a 45 degree angle, with regard to the respective flexibly connected member from which it projects, means spaced from an adjacent to said second member to retain a picture, removable means to be positioned between adjacent ones of said second members in the plane defined thereby to contact said adjacent second members when said respective first members are arranged in a straight line, and means to hold the ends of the strip together when said frame is formed.

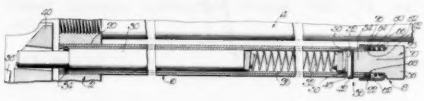
3,883,976
SAFE QUICK-RELEASE LOCK OF CARTRIDGE FEED UNIT TO MAGAZINE OF FIREARM

Gerald F. Norman, Wallingford, and William E. Osborne, Guilford, both of Conn., assignors to The Marlin Firearms Company, North Haven, Conn.

Filed Feb. 20, 1974, Ser. No. 443,942
Int. Cl. F41c *25/08*
U.S. Cl. 42—49 R **8 Claims**

1. A cartridge feed unit for a firearm with a receiver, a cartridge lifter therein, and a tubular front magazine on the receiver with a load opening forward of the latter, comprising

a tube slidable in the magazine and having an end cap accessible at the forward magazine end and manipulatable to retract the tube from and thrust it into a home position in which said cap closes the forward magazine end, a cartridge follower slidable in said tube, a compression spring in said tube between said cap and follower and preloaded to urge the latter rearwardly for holding the rearmost of any number of cartridges in the magazine, including one, in transfer engagement with the lifter, a stop in said tube to hold said follower out of jamming reach of the lifter when the magazine is empty, said cap and magazine being termed members, respectively, a



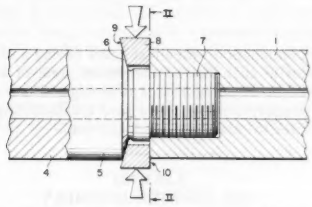
releasable connection between said members to hold said tube in said home position, with said connection providing companion pin and bayonet slot formations on the respective members, and said connection being made on said tubethrust manipulation and a succeeding twist manipulation of said cap member, and a lock for said connection providing spring means carried by one of said members, and becoming first seated on the other member and then loaded on said tubethrust manipulation of said cap member, with said spring means remaining loaded on the succeeding twist manipulation of said cap member.

3,883,977

RIFLE

Samuel A. McClure, Decatur, Ill., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Sept. 17, 1973, Ser. No. 398,228
Int. Cl. F41c *27/00*
U.S. Cl. 42—75 B **1 Claim**



1. A rifle having a receiver having an internally threaded firing chamber and a substantially planar end surface, the firing chamber opening into the end surface, said rifle comprising

a rifle barrel having a muzzle end and a breech end having a substantially tapered surface tapering toward the breech end as it extends radially outward and an externally threaded hollow cylindrical axial projection adapted to be threadedly coupled in the firing chamber thereby permitting different caliber rifle barrels to be removably mounted on the same receiver; and

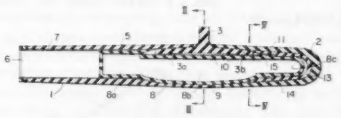
a split ring adapted to be mounted on the projection of the rifle barrel and interposed between and abutting the breech end of the rifle barrel and the end surface of the receiver thereby aligning the barrel in the receiver, one axial surface of the split ring being tapered in correspondence with the breech end of the rifle barrel and the other axial surface of the split ring being substantially planar in correspondence with the planar surface of the receiver, the split ring having a smooth inner surface, and further comprising bolt means for securing the free ends of the split ring to each other to tighten the split ring in position.

3,883,978

DEVICE FOR MOUNTING FISHING REELS TO FISHING TACKLE

Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Shizuoka-ken, Japan

Filed July 12, 1973, Ser. No. 378,496
Int. Cl. A01k *87/06*
U.S. Cl. 43—22 **3 Claims**



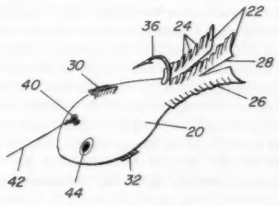
1. A device for mounting spinning reels which comprises in combination, a fore-grip portion having a front bore for attachment to an end of a fishing rod, an axially elongated connector tightly secured by one end into a rear bore of the fore-grip portion, said connector having a peripheral cut-out along a surface thereof, a portion of the peripheral cut-out extending under the fore-grip portion, a cut-out opening along the rear bore of the fore-grip portion and disposed above the peripheral cut-out, screw threads formed on the rear part of the connector, a cap-like rear-grip portion having an axial hollow recession disposed for receiving said connector and a portion of the peripheral cut-out, a securely fixed tubular cap disposed within the rear-grip portion, said tubular cap having screw threads on an inner surface thereof disposed to mate with said screw threads of the connector, the fore-grip portion being joined axially with the rear-grip portion by means of the connector, opposed flanges of a spinning reel being accommodated in the peripheral cut-out and within the fore-grip portion and the rear-grip portion, a stem member of the opposed flanges being accommodated by the cut-out opening of the fore-grip portion when the rear bore of the fore-grip portion is clamped firmly to the rear-grip portion.

3,883,979

ARTIFICIAL FISHING LURE

William O. Williams, Jr., 1309 Lynhurst Dr., Gastonia, N.C. 28052

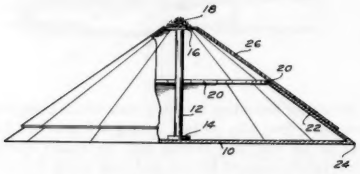
Filed Mar. 2, 1973, Ser. No. 337,302
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.09 **9 Claims**



1. An artificial fishing lure comprising a hook and a supporting portion therefor, an exterior surface-forming portion of thin, resilient, toy balloon-like material mounted on and enclosing said hook-supporting portion, said surface-forming portion including a plurality of outwardly curved tail fin-forming sections extending freely and separately in a longitudinal direction at the rear end of said surface-forming portion, said material for each of said tail fin-forming sections being formed with a concave curvature transversely to the longitudinal extent thereof to thereby form opposed fins with laterally outwardly disposed longitudinal edges, and said surface-forming portion having an open rear end between said tail

fin-forming sections through which said hook-supporting portion is insertable and removable.

3,883,980
MOUSETRAP
Steve H. Johnston, 428 Stradford Ave., Apt. 4D, Brooklyn, N.Y. 11218
Filed Mar. 11, 1974, Ser. No. 449,635
Int. Cl. A01m *23/04*
U.S. Cl. 43—69 **1 Claim**



1. A mouse trap employing bait and comprising:
a horizontal flat base member defining a regular polygon of N sides where N is an integer in excess of two;
a vertical shaft secured to the center of the member and extending vertically upward;
a small flat horizontal disc secured to the top end of the shaft and centered thereon, said disc defining the same shape of N sided regular polygon as said member but having a much smaller area, whereby each side of the disc is much shorter than the corresponding side of the member, said bait being disposed removably on top of said disc;
means disposed horizontally about the shaft at a point intermediate the ends of the shaft and having a periphery defining a regular polygon centered on said shaft, said polygon also having the same N sides and shape as the disc and member, each side of the means polygon being shorter than the corresponding side of the member and longer than the corresponding side of the disc;
N like outwardly and downwardly extending plates secured at side edges to each other, each plate being secured at its top edge to a corresponding side of the means and at its bottom edge to a corresponding side of the member, said plates peripherially enclosing and extending between the means and member; and
N like normally closed trap doors disposed between the means and disc, there being minimal separation between the doors, each door inclining downwardly and outwardly with a top edge adjacent but spaced from a corresponding side of the disc, each door being pivotally secured at a point intermediate its ends to a corresponding side of the means, the bottom edge of each door overlapping the top edge of a corresponding plate whereby the doors are normally closed by weight of gravity, any door when a mouse steps thereon, being caused to open because of the weight of the mouse, thus causing the mouse to fall through the means upon the member and be trapped alive.

3,883,981
HOLDER FOR FISHLINE RELEASE BUTTON
August C. Bohn, 1423 Walnut N.E., Grand Rapids, Mich. 49503
Filed July 18, 1974, Ser. No. 489,809
Int. Cl. A01k *91/00*
U.S. Cl. 43—43.12 **8 Claims**

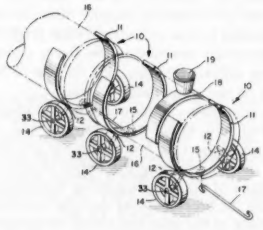
1. In combination with a fishing rod and a fishing line associated with said rod, and with a ring normally traversed by said line, a ring holder comprising:
a clamping member adapted to engage said rod adjacent the tip thereof;
an arm normally extending from said clamping member parallel to said rod and beyond said tip; and

clip means adapted to releaseably secure said ring to said arm.

3,883,982
KAZOO AND FACE MASK COMBINATION
Joseph Michael McClary, Brentwood, Tenn., assignor to Kusan, Inc., Nashville, Tenn.
Filed Apr. 5, 1974, Ser. No. 458,249
Int. Cl. A63h *5/00*
U.S. Cl. 46—1 F **3 Claims**

1. The combination with a face mask having a substantially vertical slot in each side of the mouth area; of a vertically disposed kazoo diaphragm support having ends inserted in the slots for support thereby; and a cord for encircling the head of the wearer to retain said mask thereon.

3,883,983
TOY ADAPTER ASSEMBLY
Ora Coster, Beyt Horon Street 7, Tel Baruch, Israel
Filed Nov. 8, 1973, Ser. No. 414,086
Claims priority, application United Kingdom, Mar. 9, 1973, 6526/73
Int. Cl. A63h *33/06*
U.S. Cl. 46—17 **11 Claims**



1. A toy adapter assembly capable of being removably affixed to a container to form therewith a toy, said assembly comprising an integrally formed unit comprising a generally

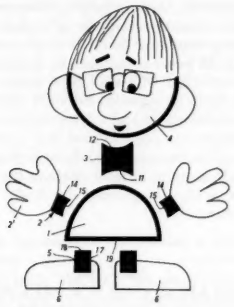
omega-shaped resilient support member with an open top for clasping the container, at least one axle bracket extending generally radially outwardly therefrom, and axle hub means on said bracket, and mobile means capable of being removably mounted on said axle hub means.

3,883,984

PUPPET LIKE DUMMY

Albert Champeaux, 9 Bis, Rue Michel Chasles, Paris, France (75012)

Filed Nov. 28, 1973, Ser. No. 419,700
Claims priority, application France, Dec. 12, 1972, 72.44104
Int. Cl. A63h *33/00*
U.S. Cl. 46—22 **9 Claims**



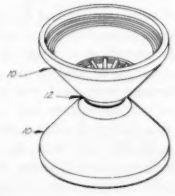
1. A dummy comprising, in combination, a plurality of elements displaceable relative to each other for representing various attitudes of a model symbolized by said dummy; at least two of said elements constituting main elements formed of a ferro-magnetic material and each having at least one substantially spherical surface portion; at least one other of said elements being constituted by a permanent magnet interposed between said two ferro-magnetic main elements; said permanent magnet having two opposite pole surfaces each in magnetic engagement with a spherical surface portion of a respective main element; said pole surfaces being concave and substantially complementary to the engaged spherical surface portion.

3,883,985

DIABLO WITH SLIDING PIN CLUTCH AND RADIAL BEARING SURFACES

Edwin A. Dawson, Jr., 5319 Kugler Mill Rd., Cincinnati, Ohio 45236

Filed Mar. 8, 1973, Ser. No. 339,869
Int. Cl. A63h *1/00*
U.S. Cl. 46—60 **10 Claims**



1. In a "diablo" type spinning toy for use with a driving string including a pair of truncated conical end bells arranged in spaced apart, nose-to-nose relationship, the improved clutch assembly in combination therewith comprising:

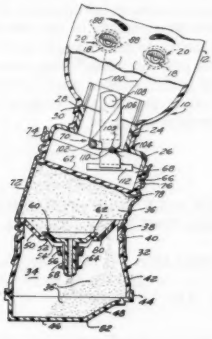
a. a shaft, the ends of said shaft being non-rotatively engaged in said end bells;
b. an escapement pin mounted in and slidable transversely through a transverse perforation through said shaft at the longitudinal center of said shaft;
c. a hollow clutch race having on its interior surface a plurality of camming surfaces and driving surfaces cooperating with said pin to drive said shaft at its longitudinal center in one direction and to over-run in the opposite direction; and
d. means rotatably journaling said clutch race about said shaft, said means comprising a pair of truncated conical race cups in nose-to-nose relationship, the large ends of said truncated conical race cups being provided with inturned flanges, said means further comprising surfaces on said shaft, said flanges cooperating with said shaft surfaces to provide radial bearing surfaces.

3,883,986

DOLL WITH EYE-CLOSING MEANS RESPONDING TO LATERAL TILTING AND SEPARATE EYE-CLOSING MEANS RESPONDING TO REARWARD TILTING

Herbert Thorn, Jamaica, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.

Division of Ser. No. 247,567, May 30, 1972, Pat. No. 3,789,544. This application Nov. 14, 1973, Ser. No. 415,606
Int. Cl. A63h *11/00*
U.S. Cl. 46—135 R **7 Claims**



1. A toy doll including a body and head, said head having simulated facial features including eye sockets, and a pair of simulated eye units mounted in said sockets, said units having eye members mounted for movement between open and closed positions, means contained entirely within said head and body for automatically moving said eye members towards said closed position merely in response to lateral tilting of said doll's body and head, said tilting being in at least one lateral direction, and separate means for moving said eye members towards said closed position, independently of said lateral tilting of said doll, when said doll is tilted in a direction generally transverse to the direction of said lateral tilting rearwardly towards a generally horizontal recumbent position.

3,883,987

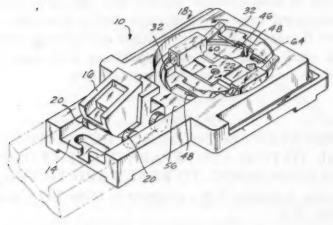
TOY VEHICLE TURNTABLE

Madhusudan Joshi, Levittown; Edwin A. Nielsen, Oceanside, and Frank D. Ventura, Commack, all of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed May 15, 1974, Ser. No. 469,992
Int. Cl. A63h *19/00*
U.S. Cl. 46—202 **17 Claims**

1. A turntable for a self propelled toy vehicle having at least one drive wheel, said turntable comprising a base along which said toy vehicle may travel and vehicle support means located in the path of travel of said vehicle for supporting the vehicle

with said at least one drive wheel in engagement with said base, said support means being rotatably mounted on said base for rotational movement in a plane parallel to said base whereby engagement of said drive wheel with said base causes said support means to rotate and change the direction of travel of said vehicle; and vehicle barrier means for preventing movement of the vehicle from said support means until said support means has rotated through a predetermined angle of rotation; said barrier means comprising an abutment bar mov-



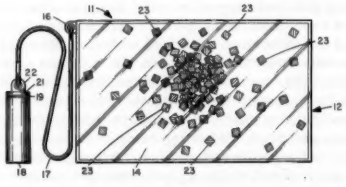
ably mounted on said support means for movement between a first position normally blocking movement of the vehicle off of said support means in its direction of travel and a second position permitting passage of the vehicle off of the support means; and means on said base for moving said abutment bar to its second position when said support means has rotated through said predetermined angle of rotation, whereby said vehicle will continue off of said support means in a new direction along its path of travel.

3,883,988

MAGNETICALLY OPERATED AMUSEMENT DEVICE

John G. Fields, 5309 Princess Anne Rd., Virginia Beach, Va. 23462

Filed Mar. 14, 1974, Ser. No. 451,227
Int. Cl. A63h *33/26*
U.S. Cl. 46—239 **2 Claims**



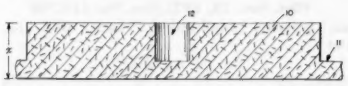
1. An amusement device, comprising:
an at least partially transparent container formed of a non-magnetic material; and
a plurality of substantially small, substantially light, variously colored magnetizable elements operationally enclosed within said container, each of said magnetizable elements being a segment of magnetic recording tape having a surface coated with one of a plurality of coating materials each of a different color, said magnetizable elements being adapted to move about within said container to form various patterns thereof in various color combinations under the influence of the magnetic field of a magnet adapted to be maneuvered exteriorly about said container.

3,883,989

EXPANDABLE SHAPE-RETAINING PEAT MOSS BRIQUETTES AND METHOD OF PRODUCING SAME

Odd S. Melvold, Oslo, Norway, assignor to Jiffy Products International Ltd., Zug, Switzerland

Continuation-in-part of Ser. No. 222,945, Feb. 2, 1972, abandoned. This application Oct. 29, 1973, Ser. No. 410,799
Int. Cl. A01g *9/10*
U.S. Cl. 47—37 **16 Claims**



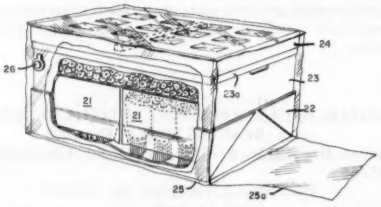
13. An expandable, shape-retaining compressed peat moss briquette which consists essentially of a peat moss bitumen mix with a water content of from 10 to 25 percent by weight and from 15 to 40 percent bitumen by weight, said bitumen having been contacted with said peat moss by intermixing into said peat moss an aqueous bitumen emulsion having a continuous aqueous phase and a dispersed bituminous phase, and the admixture has been formed into a body having the general shape of the briquette and then compressed to reduce the height of the body to at least one-half the uncompressed height thereof while integrating the body into a shape-retaining briquette.

3,883,990

METHOD AND APPARATUS FOR PACKING, SHIPPING AND MARKETING OF PERISHABLE PRODUCTS SUCH AS CUT FLOWERS

David L. Stidolph, P.O. Box 158, Salinas, Calif. 93901

Continuation-in-part of Ser. No. 173,421, Aug. 20, 1971, Pat. No. 3,754,642. This application Mar. 28, 1973, Ser. No. 345,739The portion of the term of this patent subsequent to Aug. 28, 1990, has been disclaimed.
Int. Cl. A01g *5/00*; **B65d** *85/50*
U.S. Cl. 47—58 **6 Claims**

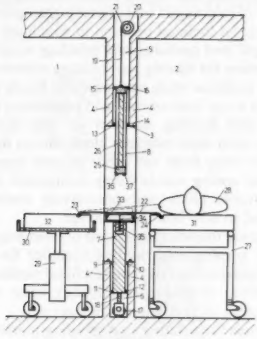


1. In the process of transporting and displaying of cut flowers, the steps comprising providing a box body of substantially waterproof material, providing a cover for the box body, scoring predetermined areas of said cover, placing a plurality of bunches of cut flowers into said box body, placing said cover on said box body, transporting said covered box body, and flowers therein to a selected sales outlet for the flowers, removing the cover from the box body, forming holes in said cover at said predetermined scored areas, removing the flowers from said box body, placing a predetermined amount of water into said box body, placing said cover on said box body, inserting said bunches of cut flowers into said holes, immersing the cut ends of said flowers into the water in said box body and displaying said cut flowers at said sales outlet upright in the holes in said cover.

3,883,991
PASSAGE FOR PATIENTS

Terje Adelhed, Jakobsberg, Sweden, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 4, 1973, Ser. No. 421,610
Claims priority, application Germany, Dec. 4, 1972, 2259347
Int. Cl. E06b 7/00
U.S. Cl. 49—70 1 Claim

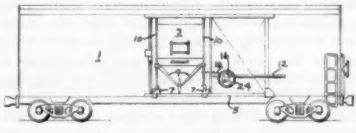


1. A passage for patients formed in a wall separating a sterile room from a non-sterile room, comprising a substantially horizontal table-like plate for transferring the patients from one room to the other one, said plate being adapted to the width of the passage and having longitudinal sides extending on both sides of the wall, the edges of said longitudinal sides being adaptable each one to the bearing surface of the patients on its side of the wall, a lower wall part constructed as a closure member adapted to the width of the passage, means supporting said lower wall part upon the wall for vertical movement and for partially closing the passage, said table-like plate being mounted upon the top of said lower movable wall part for swinging movement relative to its edges, said edges being bent downwardly and having a thickness of a few millimeters, a second wall part situated above said first-mentioned wall part, and means supporting said second wall part upon the wall for vertical movement against said first wall part for closing the passage, the second wall part being optically transparent, the means supporting said second wall part operating it independently from the means supporting said first wall part.

3,883,992
CAR DOOR OPERATING STRUCTURE

Luther L. Bollinger, Sr., Reading, Pa., assignor to Hennessy Products, Incorporated, Chambersburg, Pa.

Continuation of Ser. No. 276,671, July 31, 1972, abandoned. This application Dec. 14, 1973, Ser. No. 425,176
Int. Cl. E05f 11/34
U.S. Cl. 49—362 3 Claims

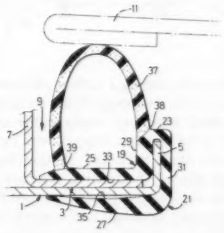


1. In a railway car, a side wall with a door opening, a door movable along said wall to overlie or to expose said opening, an elongated rack extending lengthwise of said wall and secured thereto, said rack having teeth along its lower edge and a smooth upper edge, a housing offset from said door lengthwise of the car and slidable along the upper edge of said rack, link means forming the sole connection between said housing and said door whereby they move together lengthwise of the car, a first pinion journaled in said housing and engaging the toothed lower edge of said rack, means for manually rotating said pinion to move said door along said rack, and a second pinion journaled in said housing and engaging the toothed lower edge of said rack, said second pinion being spaced longitudinally of said rack from said first pinion whereby to oppose tilting of said housing about a transverse axis and its consequent binding on said rack.

3,883,993
EDGE PROTECTOR STRIP AND SEALING STRIP

Ronald Ernest Pullan, Leeds, England, assignor to Schlegel (UK) Limited, Leeds, England

Filed May 18, 1973, Ser. No. 361,399
Claims priority, application United Kingdom, Jan. 15, 1973, 2062/73
Int. Cl. E06b 7/232
U.S. Cl. 49—490 13 Claims

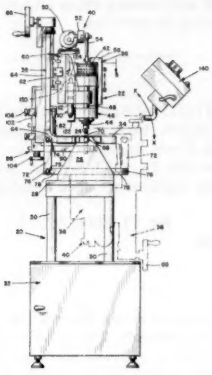


1. An edge protector strip for a flange generally L-shaped in cross section and having an inclined edge portion forming the shorter straight portion of said L shape and a longer straight portion of said L shape extending away from said inclined edge portion as described, said strip being manufactured from a resiliently deformable rubber or plastics material and being of indefinite length, the strip, in cross section being of generally L-shape and having a pair of spaced apart arms defining a channel shaped to receive said L-shaped flange, each of said arms being shaped at least on their facing surfaces to provide a generally straight portion extending inwardly from a free side edge of said strip at one end of said arms to overlie said longer straight portion of the flange and conceal both sides of said flange, and a further portion of said arms inclined at a predetermined angle to said straight portion and connected thereto at an elbow at the other end of said straight portion, to fit around said inclined edge portion of said shorter straight portion of said flange, said straight portions of said arms being substantially longer than said further portions of said arms, and the thickness of said arms being substantially less than the length of said arms, and including a web spacing said arms apart and connecting together the ends of said further portions remote from said elbow to fit over the free end of said flange whereby the flange receiving channel between said two arms has dimensions similar to those of the flange to which the strip is to be applied and substantially completely covers the flange without requiring any additional fastening devices.

3,883,994
PROFILE GRINDING APPARATUS

Charles L. Dellinger, 1110 Alexander St., Statesville, N.C. 28677

Filed Nov. 12, 1973, Ser. No. 414,740
Int. Cl. B24b *17/00*
U.S. Cl. 51—34 C 9 Claims

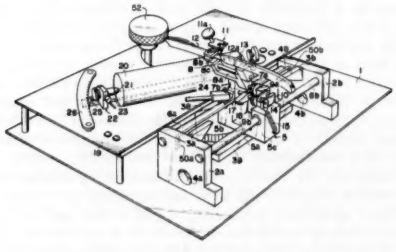


1. A machine for shaping a surface of a work piece comprising; a base structure, a support frame mounted upon said base structure, a head assembly displaceable upon said support frame, a work table for supporting a work piece, a shaping tool having an axial shaft mounted in said head assembly and adapted to be placed in working relation to a work piece, follower means mounted upon said support frame and adapted to engage a template attached to the work piece, said follower means including an axially aligned stylus displaceable with said shaping tool, means mounting said head assembly for rotation between positions above and below a work piece located upon said work table, and means for axially moving said tool independently of said stylus.

3,883,995
AUTOMATIC SHARPENING DEVICE

Taro Ohashi, 2809 Kokubo, Futtsu-shi, Chiba-ken, Japan

Filed Oct. 3, 1973, Ser. No. 403,254
Claims priority, application Japan, July 4, 1973, 48-79548
Int. Cl. B24b *7/02*
U.S. Cl. 51—91 BS 6 Claims

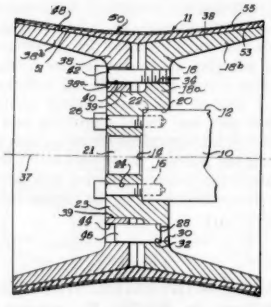


1. An automatic sharpening device for sharpening an edged tool, comprising:
a base plate;
a pair of supporting members mounted on said base plate and having a rod extending between said supporting members;
a cylindrical grinding member whose axis is angularly disposed with respect to said rod;
a movable block which is reciprocally mounted on said rod; a member for holding said edged tool angularly with respect to the axis of said cylindrical grinding member, said holding member being pivotally mounted on said movable block and having a first inclined position where one side of said edged tool contacts said grinding member and a second inclined position in which the other side of said edged tool contacts said grinding member;
a spring means for biasing said holding member to said first inclined position while said movable block moves in one direction away from one of said supporting members and biasing said holding member to said second inclined position while said movable block moves in the opposite direction away from the other of said supporting members, said spring means being connected at one end to said movable block and operatively connected at the other end to said holding member;
a pair of guide members provided on said supporting members for turning said holding member from one of its inclined positions to its other inclined position against the spring force of said spring means when said movable block comes to said guide member; and
driving means for rotating said grinding member and reciprocating said movable block.

3,883,996
TREAD GRINDING WHEEL

Gustav M. Waller, Geneva, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Jan. 7, 1974, Ser. No. 431,115
Int. Cl. B24b *45/00*
U.S. Cl. 51—206 R 7 Claims



1. A grinding wheel assembly for a tire tread grinding apparatus having a drive shaft, said grinding wheel assembly comprising a first hub section, first fastening means for directly fastening said first hub section to the drive shaft for rotation therewith, a second hub section, second fastening means for fastening said second hub section only to said first hub section, each of said fastening means being exposed and accessible for independent disassembly, complementary aligning and orientating means for axially aligning and angularly orienting said first and second hub sections thereby to maintain said hub sections in the same alignment and orientation upon reassembly of said hub sections after said hub sections are disassembled, said hub sections each having oppositely directed peripheral flanges having taper wedging surfaces, said tapered wedging surfaces being formed to provide a circumference in true round about the axis of rotation of the drive shaft, and sleeve means having a circumferential abrading surface, said sleeve means being secured on said hub sections for rotation therewith with said abrading surface in a true round about the

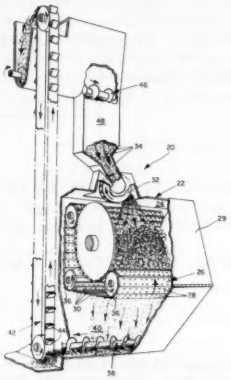
axis of rotation when said fastening means are drawn tight to fasten said first section and second sections.

3,883,997

PROCESS FOR PRODUCING HIGH-GRADE METALLIC PRODUCTS FROM SOLID SLAGS AND HIGH-GRADE METALLIC PRODUCTS

Richard D. Burlingame, Cleveland Heights, Ohio, assignor to Luria Brothers & Co., Inc., Cleveland, Ohio

Filed Nov. 2, 1973, Ser. No. 412,119
Int. Cl. B24c *1/00, 3/30*
U.S. Cl. 51—316 **10 Claims**



1. A process for recovering a relatively pure metal having a slag content not exceeding 10 percent by weight from a piece of such metal containing a softer slag impurity rigidly adhered thereto and located at least in substantial part within crevices and fissures accessible to the surface of said metal, comprising:

a. Breaking said metal containing impurities into pieces having a substantial amount of such slag impurities exposed at or to the surface of each piece;

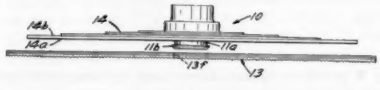
b. Continuously tumbling a mass of such pieces against each other in order to achieve a relatively uniform redistribution of such pieces within such mass; and c. While effecting such redistribution, substantially continuously impacting such pieces with a shower of a substantial quantity of small particles having a hardness greater than the hardness of the slag impurities and at a high velocity of at least about 10,000 feet per minute, and for a period of time sufficient to abrade such impurities from the metal to produce a product containing not more than 10 percent by weight of said slag impurities.

3,883,998

FASTENING DEVICE FOR PSA ABRASIVE DISC

Dale M. Dosser, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 11, 1974, Ser. No. 441,262
Int. Cl. B24d *17/00*
U.S. Cl. 51—376 **9 Claims**



1. In combination, a rotary backup pad and a pressure sensitive adhesive abrasive disc having a centering opening of a regular geometric shape, said backup pad designed for supporting and readily removably retaining said disc, said backup pad comprising

a circular backup plate having a disc supporting surface;

a central fitting adapted to connect to a rotary driving shaft of a power driven tool;

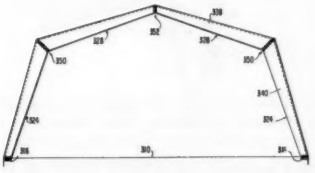
a centering button which protrudes from the disc supporting surface, which button is formed at its protruding end with a shoulder which is slightly larger than the opening of the disc and with a neck which is equal to or slightly smaller than the opening of the disc and has a length equal to or greater than the thickness of the disc at its opening to center the abrasive disc on the support surface and to restrict lateral displacement of the abrasive disc relative to the backup pad during the operation thereof.

3,883,999

BUILDING FORMED OF PRECUT, FOLDABLE SITE ERECTED PAPER BOARD

Frank S. Nicoll, Jr., Dolfield Rd., Owings Mills, Md. 21117

Division of Ser. No. 212,345, Dec. 27, 1971, Pat. No. 3,798,852, which is a continuation-in-part of Ser. No. 195,139, Nov. 3, 1971, abandoned. This application Dec. 14, 1973, Ser. No. 424,962
Int. Cl. E04b *7/02*
U.S. Cl. 52—90 **4 Claims**



1. In a building structure formed of a plurality of prefabricated fiberglass reinforced, resin treated, abutting, paper board panels with the abutting panel sides fastened together, the improvement wherein:

the sides and roof of the building are formed of a series of end to end connected, identically configured panels,

and each panel is formed of a single paper board sheet and comprises at least one center wall and integral side walls extending the length of the center wall,

contiguous tabs extend from coextensive ends of said center and side walls as defined by fold lines therein, said center wall tabs being rectangular in configuration, said side wall tabs being trapezoidal in configuration with the fold lines inclined inwardly of the center line tab fold lines and said side wall tabs being of a length equal to one-half the width of the center wall tabs such that when the end walls are folded at right angles to the center wall in the same direction and the center wall and side wall tabs are folded at right angles and in the same direction, they lie in mutually overlapped planes to form a four-ply king post or girt connection therebetween, when the series of adjacent panels are fastened in end abutting position.

3,884,000

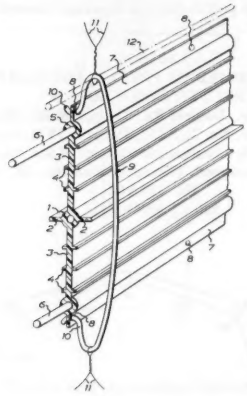
DEVICE FOR THE FIXATION OF JOINT SEALING STRIPS

Karl Erik Faleij, Box 4026, 794 00 Orsa, Sweden

Filed Jan. 23, 1973, Ser. No. 325,970
Claims priority, application Sweden, Jan. 24, 1972, 745/72
Int. Cl. E04b *1/68, 1/16*
U.S. Cl. 52—127 **2 Claims**

1. A sealing strip assembly for molding into reinforced concrete to act as a waterstop at the joint of two adjacent concrete elements comprising an elongated relatively wide and substantially flat strip of resilient waterproof material

having a central portion adapted to be positioned at the joint between the two concrete elements and a pair of oppositely directed side flanges adapted to be molded one in each of the concrete elements at the time of casting these elements, and a plurality of pairs of holes formed in the strip at spaced intervals along the length thereof with one hole of each pair being located adjacent the outer edge of each of the flange, an elongated bracket formed from a rigid resilient material and including a body portion extending transversely across said strip adjacent a pair of said holes and having a length greater than the width of said strip, a reversely bent arm portion integrally formed on said body portion at each end thereof and



projecting inwardly and laterally therefrom in position to project one through each hole of one pair of the holes in the strip, said arms and body portion cooperating to define an inwardly open generally U-shaped portion positioned outwardly from the holes and spaced from said strip and a hook portion on the end of each said arm in position to releasably retain the strip on the bracket when said arms are positioned in the holes, said hooks being spaced apart a distance at least as great as the holes of the pairs of holes whereby the bracket is adapted to retain the strip in a substantially flat outstretched condition, said U-shaped portion being adapted to embrace a concrete reinforcing element to support the assembly in position during casting of the concrete.

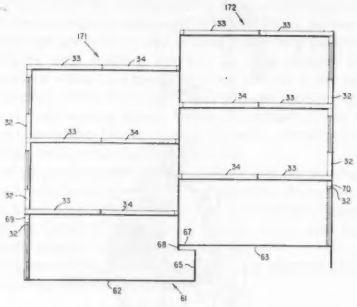
3,884,001

SPLIT-LEVEL TOWNHOUSE

Adolfo Tylius, Washington, D.C., assignor to Alvic Development Corporation, Washington, D.C.

Filed May 17, 1974, Ser. No. 470,743
Int. Cl. E04f *11/14*
U.S. Cl. 52—185 **7 Claims**

1. A split-level townhouse formed of a relatively small number of pre-formed load bearing slabs on a split-level foundation, said slabs comprising: a plurality of first rectangular wall slabs each having a first set of dimensions, a plurality of second rectangular wall slabs having a second set of dimensions, each of said wall slabs having a height of approximately one story, a plurality of third rectangular ceiling slabs having a third set of dimensions, and a plurality of fourth right hexagonal ceiling slabs, each of said ceiling slabs having approximately the same length equal to the breadth of the townhouse between adjacent ones of said first rectangular wall slabs, a plurality of one-half story stair sections, said townhouse comprising: a first section built up from one level of the foundation, a second section built up from a second level of the foundation said first and second sections each including a plurality of ceilings formed from the ceiling slabs, adjacent ceilings of the first and second sections being vertically displaced one-half story from each other, the ceilings of at least all but two of the stories of the first and second sections including only one of the third slabs and only one of the fourth slabs, said third and fourth slabs of each ceiling having abutting first and second interconnected parallel edges extending across the breadth of the section between parallel first wall slabs forming sidewalls of the section, said second wall slabs forming exterior walls of each story of each section at right angles to the sidewalls, each of the fourth slabs having third and fourth edges parallel to each other and each of the first and second edges, each of the third and fourth slabs of both



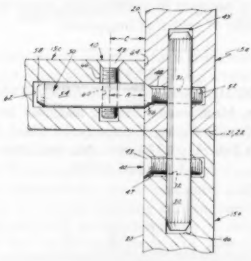
sections having parallel side edges aligned with each other and the first sidewall slabs, said fourth edges being displaced from the second edges by a distance less than the third edges, said fourth edges of the fourth slabs of the two sections being parallel to and displaced from each other by an extent sufficient to form a stairwell running between the two sections, the third edges of the fourth slabs being displaced from each other by a distance sufficient to form a vent shaft running between the two sections, and one of said stair sections being interconnected between the fourth edges of the different fourth slabs of adjacent different stories of the first and second sections.

3,884,002

PARTITION SYSTEM

Charles F. Logie, Spring Lake, Mich., assignor to American Store Equipment Corporation, Muskegon, Mich.

Filed Mar. 15, 1973, Ser. No. 341,360
Int. Cl. E04b *1/48*
U.S. Cl. 52—285 **16 Claims**



1. A partition system comprising: at least two movable partitions; a connector having a first axis extending from one of said partitions to the other, said connector including at least one pin-receiving aperture extending therethrough generally transverse to said first axis; an aperture in one of said partitions extending into said partition from a first surface gener-

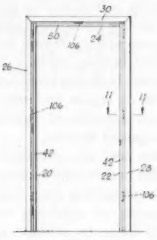
ally adjacent the other of said partitions; the other of said partitions and said connector including securing means cooperating to secure said connector thereto with said connector projecting therefrom and into position in said aperture in said one partition; said one partition also including an opening extending generally laterally of said aperture through a second surface of said one partition and communicating with said aperture; a pin having a shank of a predetermined cross-sectional area and an enlarged head, said head tapering outwardly from said shank; said opening having a tapered area receiving said head; said pin being received in said pin-receiving aperture of said connector, through said opening; the center of said tapered area being offset from the center of said pin-receiving aperture in a direction away from said first surface of said one partition such that contact between said head and tapered area of said opening, combined with the fact that said pin is positioned in said pin-receiving aperture of said connector and said connector is secured to said other partition, wedges said one partition tightly against said other partition.

3,884,003

METAL FRAME FOR DOORWAYS

Theodore Z. Herr, Highland Park, Ill., and Daniel J. McClure, Clarksville, Mich., assignors to Leigh Products Inc., Grand Rapids, Mich.

Filed May 29, 1973, Ser. No. 364,930
Int. Cl. E06b *1/20*
U.S. Cl. 52—212 **14 Claims**



1. A sheet metal frame for a door opening in a wall comprising

a pair of front jamb parts,

a front header part,

a pair of rear jamb parts,

a rear header part,

means connecting said header parts in crossing relation over the upper ends of their respective jamb parts,

each of said parts having a wall engaging flange and a transversely turned flanged adapted to project into the door opening,

the transversely turned flanges on said front jamb parts having door stop ribs of U-shaped cross section formed along the rear edges thereof and extending the full length of the jamb parts,

the transversely turned flange on said front header part terminating short of the ends of the wall engaging flange thereof and overlying the transversely extending flanges of the front jamb parts and having a further shortened U-shaped door stop rib on its rear edge which abuts the transverse sides of the stop ribs on the front jamb parts, the transverse flanges on said rear jamb and rear header parts projecting forwardly in lapped relation over the outer sides of said door stop ribs,

the wall engaging flanges of said parts having holes formed inwardly of their off-set edges to receive fasteners to be driven into the wall,

outwardly off-set tongues extending downwardly from the overhanging ends of the wall engaging flanges on said header parts,

outwardly off-set ribs extending as continuations of said tongues into the wall engaging flanges of the header parts and curved laterally inwardly across the tops of the transverse flanges on the jamb parts,

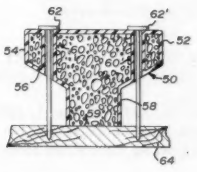
and outwardly off-set straps along the ends of the wall engaging flanges of the jamb parts forming slots retainingly receiving said tongues.

3,884,004

FASTENING INSERT FOR CONCRETE STRUCTURES

William L. Douma, P.O. 53 Whippany Ave., West Paterson, N.J. 07424, and Herman N. Douma, 488 Berkshire Rd., Ridgewood, N.J. 07450

Filed July 27, 1973, Ser. No. 383,463
Int. Cl. E04b *1/41*; **E04g** *17/00*
U.S. Cl. 52—309 **10 Claims**



1. A fastening device adapted to be embedded in concrete comprising: an integral body member of generally uniform composition and formed of high density foam molded cellular plastic material, said body member having an upper portion and a lower portion, said upper portion being larger than said lower portion and having an undersurface tapering convergingly towards and overhanging said lower portion, said upper portion having at least one elongate aperture extending generally longitudinally along an axis located outside the perimeter of said lower portion, said aperture being arranged to accept a fastener for attaching said fastening device to a concrete mold form, said lower portion of said body member terminating in a generally contiguous planar bottom surface arranged to seat intimately against a concrete mold form and be totally exposed upon removal of the mold form to permit the attachment of an external member to said fastening device at any desired location within said bottom surface.

3,884,005

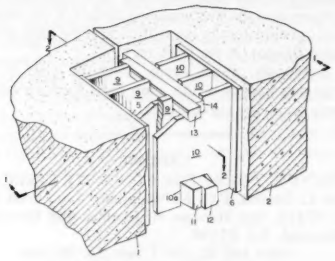
STRUCTURE FORMED OF FINISHED COMPONENTS

Josef Alfons Wey, Farngut Wohlerstrasse, Villmergen, Switzerland

Filed Mar. 29, 1973, Ser. No. 346,057
Claims priority, application Sweden, Apr. 6, 1972, 5029/72
Int. Cl. EO4c *5/16*, *1/30*
U.S. Cl. 52—585 **2 Claims**

1. A joint structure including a pair of preformed structural elements to be joined, said elements having adjoining recesses open at the top and bottom, a base plate anchored in each of said recesses, a plurality of vertical spaced, parallel plates extending from each of said base plates, said parallel plates extending beyond the outer edges of said recesses with the edges of the plates of one element overlapping the plates of the adjoining element, the upper horizontal edge of said parallel plates of at least one of said elements being shaped to form part of a wedge-receiving recess, the free edge of the parallel plates of the other adjoining element being shaped to cooperate with said part to complete said wedge-receiving recess, wedge means in said last mentioned recess, the bottom edge of said parallel plates being shaped to form a second wedge-receiving recess and wedge means in said recess, the upper

recess and wedge means being designed to take up compression force between the two adjoining structural elements and



the bottom recess and wedge means being designed to take up tension force between the adjoining structural elements.

3,884,006

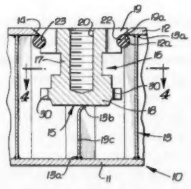
SANDWICH PANEL INSERT

Robert W. Dietlein, 2904 Harmony Pl., La Crescenta, Calif. 91214

Continuation of Ser. No. 321,245, Jan. 5, 1973, abandoned. This application May 24, 1974, Ser. No. 473,284

Int. Cl. B23p *3/00;* **F16b** *39/00*

U.S. Cl. 52—617 **6 Claims**



1. For combination with a panel sandwich assembly that includes a pair of spaced parallel panels interconnected by cellular structure, one of the panels containing a through opening, an insert partially receivable into said panel sandwich assembly through said through opening for retention, said insert comprising

a. a shank and a pair of spaced heads integral therewith, the shank having an axis, one head being generally circular and of greater diameter than the one panel opening and the other head and shank being of lesser diameter opening whereby they may be inserted into the space between the panels,

b. the one head defining an aperture to pass hardenable material into the panel sandwich assembly and into the space between the heads to permanently retain the insert to the panel assembly, the insert containing an axially threaded bore to which a threaded fastener may have access via said one head, and

c. a radially inwardly yieldably retainer retained on the insert adjacent and at the side of the one head which faces the other head, the retainer located to be deflected radially inwardly when inserted through the one panel via said opening and to expand radially outwardly immediately adjacent the inner side of said one panel to cooperate with the said one head to temporarily retain the insert against dislodgement from the panel assembly prior to hardening of the material in said assembly, said retainer consisting of a elastomeric O-ring extending at the outer boundary of said aperture, and the aperture communicating the exterior with the space between the heads via the radially inner side of said O-ring, said aperture being locally confined at one side of the shank axis and spaced radially outwardly from said axis and bore, the aperture overlying the O-ring and also extending axially completely through the head more closely to the axis than the O-ring, the head also defining an annular groove seating the radially innermost side of the O-ring, said groove intersecting said aperture.

3,884,007

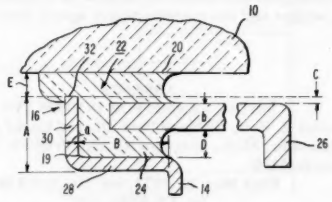
HERMETIC SEAL AND METHOD

Daniel Laverne Thoman, 42 Ridgeview Dr., Leola, Pa. 17540, assignor to RCA Corporation, New York, N.Y.

Filed June 20, 1974, Ser. No. 481,206

Int. Cl. E04c *2/54;* **G02b** *5/14;* **C03c** *17/30*

U.S. Cl. 52—624 **16 Claims**



1. A hermetic seal between two or more members comprising:

a. a first member having a first sealing surface portion;

b. a second member having a second sealing surface portion including a contoured surface region proximately spaced apart from said first sealing surface portion, said first sealing surface portion in facing cooperating relation with said contoured surface region to form therebetween an accumulation cavity capable of substantially retaining viscous material disposed therein,

c. sealing glass, within said accumulation cavity, hermetically sealing said first and second sealing surface portions,

d. means abutting said sealing glass, within said accumulation cavity, capable of applying compressive force against the sealing glass to provide compensation for shrinkage, and to substantially avoid bubble and void formation, in said sealing glass, and the material from which it is formed, during hermetic sealing and formation of said sealing glass in assembly.

3,884,008

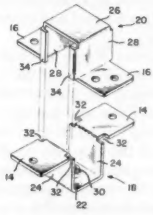
CONCRETE INSERT

Herman C. Miller, 2419 John Ave. N.W., Gig Harbor, Wash. 98335

Filed Aug. 24, 1973, Ser. No. 391,351. The portion of the term of this patent subsequent to Sept. 26, 1989, has been disclaimed.

Int. Cl. E04b *1/41*

U.S. Cl. 52—699 **10 Claims**



1. An easily assembled concrete insert formed by the telescopic interlocking of two members comprising:

a first member having a base portion, a pair of sides extending vertically upward therefrom and a pair of ears extending outward from the upper ends of said sides;

said first member including two pair of opposed slots, each pair of slots disposed on a respective one of said pair of ears adjacent said vertical sides, with the slots of each pair extending toward each other along its related vertical side;

a second member having a top portion, a pair of opposed sides extending vertically downward therefrom and a pair of ears extending horizontally outward from the lower ends of said sides;

said second member including two pair of opposed flanges disposed on the vertical edges of each of said sides, with the flanges of each pair extending inward toward each other at a generally right angle to the side on which each flange is disposed;

said first member being sized to telescopically mate with said second member such that said opposed slots slidably receive said flanges, with the flanges engaging the vertical sides of the first member in overlapping relationship, to guide said members into engagement with each other and to lock said members against transverse disengagement forces; and

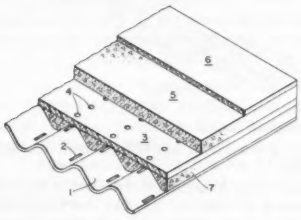
said first member including an opening in its base portion including a connecting means.

3,884,009

METHOD OF VENTILATING A ROOF SYSTEM

Robert T. Frohlich, Bedford; John L. Wright, Duxbury, and Bruce A. Blessington, Bolton, all of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Oct. 26, 1973, Ser. No. 409,849
Int. Cl. E04b *1/16, 1/20*
U.S. Cl. 52—741 **11 Claims**



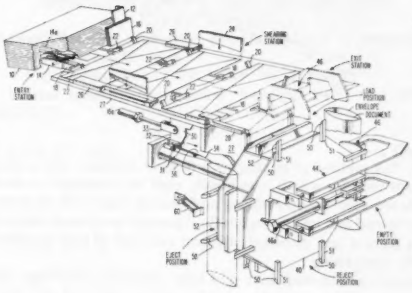
1. The method of constructing a ventilated, insulated roof comprising the steps of providing a subdeck of substantially rigid metal sheeting having a non-planar surface and apertures therethrough for permitting passage of moisture, casting a first layer of fluid lightweight insulating concrete over the metal subdeck, placing a plurality of normally low-permeance insulation boards comprised of cellular plastic material over said first layer of concrete, said boards having a plurality of openings therethrough of such dimension that passage of moisture is permitted yet substantial filling of the openings by fluid concrete placed thereon is prevented, casting a second layer of said fluid concrete directly upon said boards and thereafter placing a layer of waterproofing material over said second layer of concrete, whereby moisture from said second layer of concrete can be directly vented through the vacant openings maintained in said board, through said first layer of concrete and out said apertures in said corrugated sheeting.

3,884,010

APPARATUS AND METHOD FOR OPENING AND EMPTYING ENVELOPES OF VARIOUS THICKNESSES

Gerald Blaine Bardo, Nichols, and Leonard John Zalepa, Apalachin, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1974, Ser. No. 484,362
Int. Cl. B65b *9/00*
U.S. Cl. 53—3 **12 Claims**



11. A method of opening and emptying envelopes of various thicknesses wherein a completely emptied envelope and the documents contained therein are sorted from an envelope with a high probability of not being completely emptied comprising the steps of:

extracting a bottom envelope with documents contained therein from a hopper by means of a hopper vacuum head located at an entry station;

transporting said envelope by means of a reciprocating feed trolley to a shearing station;

shearing the ends of said envelope while said envelope is in a stationary position at said shearing station;

transporting said envelope by means of said reciprocating feed trolley to a loading platform situated over a rotatable drum having a plurality of vee pocket arms with vee pockets thereon integral therewith, said loading platform and said rotatable drum being located at an exit station;

forcing said envelope into said rotatable drum vee pocket by means of a retracting pockets flexible vacuum head, with vacuum applied, while said drum is in a load position;

rotating said envelope, said drum and said concave flexible vacuum head to an empty position;

extending said concave flexible vacuum head buckling open said envelope whereby said documents contained therein fall by gravity into a document chute;

sensing the presence or absence of said documents by sensing means integral with said document chute;

rejecting said envelope by means of a reject kicker into a reject receptacle after said rotatable drum has rotated to a reject position only if said sensing means detected the absence of said documents in said document chute; and

ejecting said envelope by means of an eject kicker into a scrap receptacle after said drum has been rotated to an eject position only if said sensing means detected the presence of documents in said document chute.

3,884,011

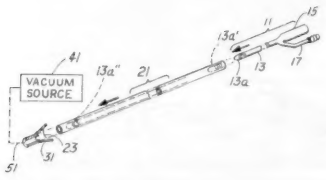
METHOD OF ASSEMBLY OF CATHETER PACKAGE

William L. Patton, North Canton, Ohio, assignor to Affiliated Hospital Products, Inc., St. Louis, Mo.

Continuation of Ser. No. 349,788, April 10, 1973, abandoned, which is a continuation of Ser. No. 150,067, June 4, 1971, abandoned. This application Nov. 16, 1973, Ser. No. 416,594

Int. Cl.[2] B65B *5/04, 7/14, 1/16*

U.S. Cl. 53—21 **8 Claims**



1. The method of packaging a flexible catheter with a tube sheath therefor which is relatively rigid as compared to such catheter, said catheter having an insertion shaft with an insertion tip end and two divergent fluid passage arms as an integral part thereof and disposed adjacent one end of said insertion shaft, comprising

inserting said shaft into said tube sheath by inserting said insertion tip end of said catheter into one end of a bore of said tube sheath, which bore is of a size to freely accommodate sliding movement therethrough of said catheter shaft, but insufficient at one end thereof to accommodate and permit passage therethrough of said two divergent fluid passage arms,

effecting a suction on the opposite open end of said tube sheath bore, while said tip end is in said one end of said tube sheath bore to draw the shaft of said catheter into said tube sheath bore, and blocking continued suction-induced movement of said shaft into said tube sheath bore through engagement of the divergent zone formed by said two divergent fluid passage arms with said one end of said tube sheath, thereby leaving said two divergent fluid passage arms extending beyond the open said one end of said tube sheath,

and thereupon removing said suction from said tube sheath.

3,884,012

METHOD AND APPARATUS FOR THE PACKING UNDER ASEPTIC CONDITIONS OF STERILE GOODS INTO CONTAINERS

Georg E. Ernstsson, Staffanstorp, and Kjell H. Martensson, Malmo, both of Sweden, assignors to Tetra Pak Developpement SA, Lund, Switzerland

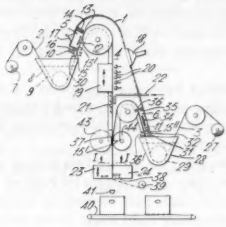
Filed July 19, 1973, Ser. No. 380,573

Claims priority, application Sweden, Aug. 11, 1972, 10419/72

Int. Cl. B65b *9/04, 55/06*

U.S. Cl. 53—22 A **8 Claims**

1. A method of forming, filling and sealing containers from a first and a second web of substantially impermeable thermoformable material of indeterminate length while under aseptic conditions comprising moving the webs in the direction of their length with one surface facing a sterile chamber, said webs constituting walls of the sterile chamber, forming a plurality of container elements in at least one of said webs, sealing the two webs together along their longitudinal side edges to form a tube, introducing a filling material into the tube to fill the container elements formed in said at least one of said webs, sealing the webs together about the edges of the container elements to close and seal the separate containers, the steps of forming the container elements, sealing the longitudinal edges of said webs to form the tube, and filling the tube with filling material being carried out while the webs constitute walls of the sterile chamber, and finally separating said



filled and sealed containers into separate containers after leaving the sterile chamber.

3,884,013

METHOD OF ASSEMBLING AND FILLING HINGED CONTAINERS

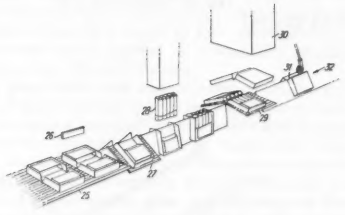
Arieh Solomon, Afeka, Israel, assignor to British and Foreign Tobacco Company, Ltd., London, England

Continuation-in-part of Ser. No. 185,510, Oct. 1, 1971, Pat. No. 3,813,025. This application Jan. 18, 1974, Ser. No. 434,802

Claims priority, application United Kingdom, Oct. 2, 1970, 46937/70

Int. Cl. B65b *5/06, 19/12*

U.S. Cl. 53—37 **4 Claims**



1. A method of assembling and filling a container comprising the steps of:

a. providing an inner structural component of the container in the form of at least two tray-like inner sections, each of which has a base portion lying out of the plane of and offset from a retaining strip for defining a pocket, the base portion and retaining strip being interconnected by a pair of opposite side walls, and the strip of one inner section being interconnected to the strip of the other inner section by a line of structural weakness defining a hinge line between the inner sections;

b. initially orienting the inner component so that the retaining strips face downwardly;

c. bending the inner component along its hinge line until the retaining strips of the two inner sections are substantially juxtaposed and substantially vertically oriented;

d. inserting products in each pocket of the sections by dropping such products substantially vertically in the pockets;

e. providing an outer structural component of the container in the form of two tray-like outer sections each of which has a base portion with a pair of opposite side walls and a pair of opposite end walls, one end wall of one section being connected to one end wall of another section by a line of structural weakness defining a hinge line between the outer sections;

f. placing the outer component in nesting relationship over the inner component so that the base portions, the side walls, and the hinge line of the outer component are juxtaposed to the respective base portions, the respective side walls, and the respective hinge line of the inner component; and

g. securing together the two components at least along their hinge lines.

3,884,014

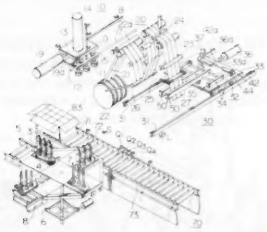
APPARATUS FOR PACKAGING AND PACKING PACKAGES OF YARN

Kinyu Ishida, 2750 Minamiyoshido-cho, and Eiji Minaka, 1362 Yogo-cho, both of Matsuyama, Japan

Filed Jan. 5, 1972, Ser. No. 215,619

Int. Cl. B65b *57/02, 57/10*

U.S. Cl. 53—55 **8 Claims**



1. Apparatus for automatically enclosing in bags and encasing packages of yarn comprising package supply means horizontally and vertically movable, bag-holding means horizontally movable, means of shifting a carton horizontally and vertically and means of controlling the package supply means, the bag-holding means and the means of shifting a carton which detects the package supply means the bag-holding means and the carton each occupy their respective positions, causes the package supply means to descend for a predetermined amount of distance, causes the carton to ascend for a predetermined distance by the means of shifting the carton, and disengages the packages from the package supply means.

3,884,015

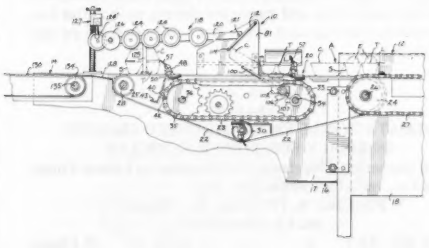
CARTON COVER CLOSING MACHINE

Kenneth W. Melton, Tecumseh, Kans., assignor to Seymour Foods, Inc., Topeka, Kans.

Filed Dec. 28, 1973, Ser. No. 429,080

Int. Cl. B65b *61/02, 7/26*

U.S. Cl. 53—131 **21 Claims**



16. An apparatus for closing the hinged cover members on cartons of the type which have a bottom tray and a cover hinged along one side edge, conveyor means for advancing successive cartons in fully open condition along a generally horizontal path with the hinge axis of the carton extending transversely of the path of advance and with the cover member leading the bottom tray member, means at a predetermined point along said path for engaging the bottom tray of successive cartons so as to restrain the tray against upward movement relative to the conveyor means, means disposed in part below the path of advance of the conveyor means which is operative to engage said cover member so as to cause said cover member to swing on said transversely extending hinge axis toward a partially closed position, and means for progressively applying downward pressure on said cover member as it is advanced by said conveyor means so as to completely close the cover member.

3,884,016

APPARATUS FOR WRAPPING GOODS WITH STRETCHED FOIL

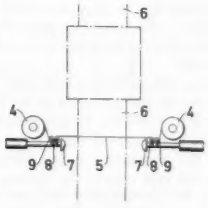
Sigward Boström, Jonkoping, Sweden, assignor to Arenco-JM AB, Jonkoping, Sweden

Filed Dec. 3, 1973, Ser. No. 420,843

Claims priority, application Sweden, Dec. 14, 1972, 16331/72

Int. Cl. B65b *11/16*

U.S. Cl. 53—182 **1 Claim**



1. An apparatus for wrapping and fixing of at least one unit of goods with or without support, the unit being enclosed on at least four sides by a foil whilst the foil is being stretched, said apparatus comprising

two foil rolls disposed one on each side of a conveying web for the unit, which foil rolls are interconnected by a coherent foil portion;

means acting together with each foil roll for braking the foil when the unit of goods is being advanced between the foil rolls to a position in which three sides of the unit are enclosed by the foil;

two opposed clamping and welding jaws capable of being moved toward each other on the fourth side of the unit of goods for joining and welding together the two foil portions separated by the unit, which jaws have a width corresponding to the foil width;

a knife member for cutting off the foil portions longitudinally through the weld or between two welds;

two pairs of brake rollers for the foil, one pair on each side of the conveying web of the unit of goods, each pair of brake rollers comprising a rotary rubber roller which is adjustably braked,

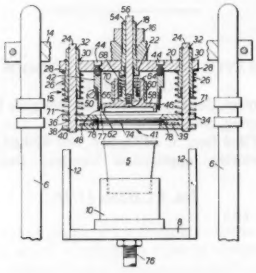
said each pair of rollers being supported by the clamping and welding jaws for performing a reciprocatory movement in correspondence with the movement of the clamping and welding jaws,

at least one roller of each pair being braked, and the foil being supported between said two brake rollers of each pair.

3,884,017
MACHINE FOR CLOSURING CONTAINERS

Peter E. Butcher, Pinner, England, assignor to Metal Box Limited, Reading, England

Filed Sept. 6, 1973, Ser. No. 394,619
Claims priority, application United Kingdom, Sept. 7, 1972, 41669/72
Int. Cl. B65b *7/28*; **B67b** *3/04*
U.S. Cl. 53—296 **3 Claims**



1. Apparatus for heat-sealing thin flexible closure material to the periphery of one end of the container, comprising

a base,

means on the base for guiding an indexable web of the closure material and leaving free of access on one surface thereof an area greater than the area of the said one end of the container,

means on the base for locating a container with its said one end facing towards the said area of the material,

means operative to move the locating means and the web guiding means towards each other so as to bring the said one end of the container on the locating means into contact with the said area of the closure material,

the web guiding means including first and second clamping plates which have aligned apertures greater in area than the area of the said one end of the container, the said plates being mounted on the base to be movable relatively towards each other and to define a gap between them for receiving and guiding the said web, and means for arresting movement of one said plate as the container locating means and the web guiding means move towards each other, whereby the other plate clamps the web to the said one plate along a line outside the said area as the container locating means and the web guiding means move towards each other,

a heatable cylindrically shaped sealing tool mounted on the base on the opposite side of the web guiding means to the container locating means with its cylindrical axis substantially perpendicular to and centrally of the said apertures, means for causing relative movement, in a direction perpendicular to the direction of web movement, between the web guiding means and the locating means on the one hand and the tool on the other hand so as to bring the tool into contact with the opposite surface of the closure material with a controlled pressure, after the closure material is supported by the end of the container, the tool having an end sized to match the periphery of the said end of the container whereby the tool applies heat to seal the closure material to the periphery of the said end of the container,

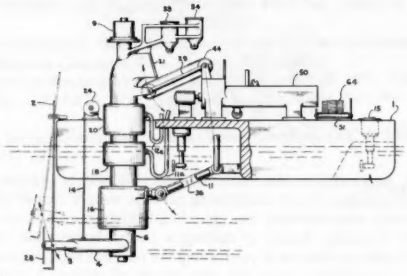
a tubular shaped knife blade mounted on the said base around the outside of the said tool for limited reciprocable movement relative thereto to contact the closure material through the said apertures and around the outside of the periphery of the container as the said relative movement continues in the said perpendicular direction, whereby the knife blade is operative to sever the closure material on the end of the container from the remainder of the web, and

tubular wipe-down means mounted between and to space apart the said tool and the knife blade and fixed to the latter to move therewith, the wipe-down means having an end surface which forms down around the container the annular region of the said closure material between the outer periphery of the container and the knife blade.

3,884,018
HARVESTING MARINE GROWTHS AND PACKAGING THE TREATED PRODUCT

Merle P. Chaplin, 609 Driver Ave., Winter Park, Fla. 32789

Continuation-in-part of Ser. No. 119,555, March 1, 1971, abandoned. This application Jan. 8, 1973, Ser. No. 321,704
Int. Cl. A01d *45/08*
U.S. Cl. 56—9 **19 Claims**



1. An apparatus for removing marine growths from a body of water, comprising, in combination: a generally tubular member having at least one inlet and being positionable beneath the surface of a body of water substantially parallel to this surface, means coupled to said tubular member for applying suction thereto to cause encountered marine growths to enter each said inlet, rotatable cutter bar means mounted on a frame means forming part of the apparatus to rotate in a plane substantially at a right angle to the longitudinal axis of said tubular member in close vicinity to each said inlet and serving to cut growths which enter said tubular member into substantially uniform lengths, means coupled to said tubular member for conducting said cut growths to a close-by location for further processing, and means for driving each cutter bar, said means for driving each cutter bar being mounted on said frame means.

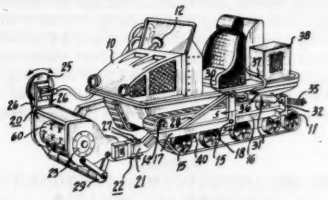
3,884,019
FLOATATIONAL FRONT MOUNTED MOWER ASSEMBLY FOR POWER VEHICLES

Michael Gerzanich, Hopelawn, N.J., assignor to Lehara Equipment Co., Inc., East Brunswick, N.J.

Filed Jan. 9, 1974, Ser. No. 431,673
Int. Cl. A01d *49/00*
U.S. Cl. 56—12.7 **15 Claims**

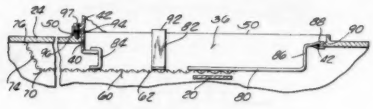
1. A propelled mower apparatus of the type employing a power vehicle including a frame, said vehicle having a front end and a back end, mower head support brackets pivotally mounted on said frame at each side thereof and pivotable both vertically and transversely, with respect to said frame at a pivot point substantially removed from said front end of said vehicle, force absorbing means coupling said brackets at said pivot point to said frame, said brackets extending beyond said

front end of said frame, and a cylindrical mowing assembly rotatably secured at each front end of said brackets and



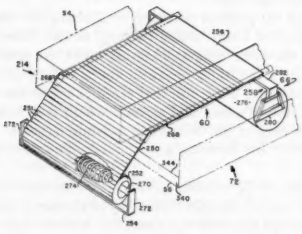
adapted to cut vegetation in an undulating surface due to the pivoting of said support brackets with respect to said frame.

3,884,020
LEAF SHREDDING MEANS FOR ROTARY MOWERS
Einar S. Dahl, and Earl H. Kidd, both of Galesburg, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Oct. 11, 1973, Ser. No. 405,447
Int. Cl. A01d *67/00*
U.S. Cl. 56—320.2 **10 Claims**



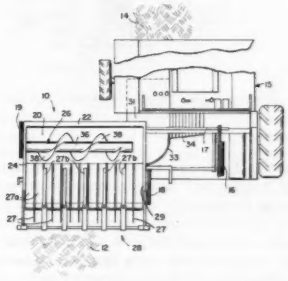
1. A rotary mower including a blade housing having a top deck and an annular wall depending from said top deck, a horizontal, arcuately-extending discharge outlet located in said top deck, a cutter blade mounted for rotary movement inside said blade housing and in a direction to impell material toward said discharge outlet, and a screen mounted on said housing and located below and in transverse relation to said discharge outlet and including a horizontal portion extending horizontally above and in close proximity to the rotational path of said cutter blade.

3,884,021
MACHINE FOR FORMING A COMPACT STACK OF CROP MATERIAL
Gene R. Butler, and Lee D. Butler, both of Kingsburg, Calif., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Apr. 5, 1974, Ser. No. 458,260
Int. Cl. A01d *87/02*
U.S. Cl. 56—346 **4 Claims**



1. In a machine for forming a compact stack of crop material such as hay or the like, the combination comprising:
a mobile chassis adapted to move across a field:
a generally rectangular stack forming chamber mounted on said chassis;
means for picking up crop material from the field and progressively forming said crop material into a stack in said chamber;
a packing roll extending across said chamber between opposite sides thereof;
carriage means coupled to opposite ends of said packing roll and mounted to said opposite sides of said chamber for movement between opposite ends of said chamber;
means for moving said carriage means between said ends of said chamber such that said packing roll progressively compacts said crop material as said stack thereof is progressively formed in said chamber.

3,884,022
MEANS FOR WINDROW MAINTENANCE
Joseph G. Landolt, Rt. 2, Box 1075, Yerington, Nev. 89447
Filed Feb. 26, 1973, Ser. No. 335,837
Int. Cl. A01d *84/00*
U.S. Cl. 56—364 **4 Claims**



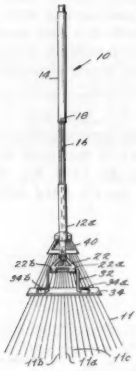
1. A machine for use in harvesting forage crops comprising:
a. an elongated mobile main platform;
b. an upstanding back wall along one side of said platform;
c. an upstanding wall member along one end of said platform;
d. a pick up means along the side of said platform opposite said back wall and adapted to pick up a windrow of said crop and deposit it on said platform;
e. means for moving said crop along the length of said platform from said one end to the other end thereof; and
f. discharge means at said other end of said platform for discharging said crop in a direction normal to the length of said platform, said discharge means comprising a second elongated platform extending rearwardly from said main platform at said other end thereof and a curved deflector wall extending along said other end of said main platform for directing said crop onto said second elongated platform.

3,884,023
SELF-CLEANING RAKE
Melvin P. Robinson, P.O. Box 152, Benton, Ark. 72015
Filed Mar. 1, 1974, Ser. No. 447,393
Int. Cl. A01d *7/10*
U.S. Cl. 56—400.1 **8 Claims**

1. A lawn broom having a handle connected to a plurality of tines having downwardly depending front ends, comprising:
a. rod means disposed longitudinally and adjacent to said handle;
b. actuator means linked to said rod means and slidably engaged with said handle for displacing said rod means longitudinally along said handle;
c. cleaning means substantially surrounding said tines and disposed substantially transverse thereto for moving over

said tines and said downwardly depending front ends; and

d. means for pivotally connecting said rod means to said cleaning means comprising a hinge bracket and an arm means, said hinge bracket having a first end thereof secured to said rod means and a second end thereof pivotally connected to said arm means, said arm means also being pivotally connected to said cleaning means so that



when said actuator means is disposed downwardly along said handle said cleaning means is correspondingly displaced downwardly over said tines and pivotally moved over said downwardly depending front ends to thereby remove material lodged on said tines, said cleaning means also being movable away from said downwardly depending front ends by displacing said actuator means upwardly along said handle.

3,884,024

TWISTING DEVICE FOR THE SZ TWISTING OF ELECTRICAL CABLES

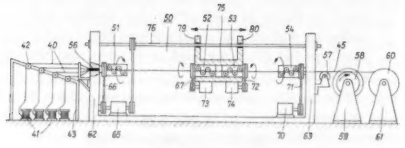
Ulrich Oestreich, Berlin, and Wolfgang Katzschner, Neustadt, Coburg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 21, 1973, Ser. No. 372,341

Claims priority, application Germany, June 28, 1972, 2232329

Int. Cl. H01b *13/04*

U.S. Cl. 57—34 AT **6 Claims**



1. An SZ twisting device for twisting the stranding elements of a cable so as to form a stranded unit which has a twist direction which changes from section to section comprising:

a. an unwinding device for the stranding elements;

b. a drawing and take up device;

c. between said unwinding device and said drawing and take up device, an accumulator which has a storage content which may be increased and decreased comprising:

1. a first stationary rotating twisting head;

2. a second rotating twisting head movable with respect to said first twisting head in the direction of the twisting axis;

3. means for moving said second twisting head back and forth with respect to said first twisting head; and

4. each of said first and second twisting heads having rollers therein, and each of said first and second twisting heads gripping the stranding elements which are being combined into a stranded unit frictionally in the direction of the circumference of the rollers within said twisting heads so as to permit ease of pulling through of the stranded unit and holding the stranded unit in a stretched condition between the twisting heads.

3,884,025

METHOD AND APPARATUS FOR MAKING SZ-TWISTED COMMUNICATIONS CABLE

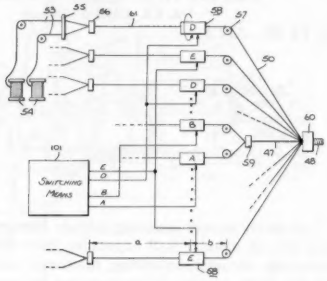
Heinz Oberender, Neustadt, Coburg, and Dieter Vogelsberg, Berlin, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 10, 1973, Ser. No. 387,248

Claims priority, application Germany, Aug. 11, 1972, 2240199

Int. Cl. H01b *13/04*; **D07b** *3/00*

U.S. Cl. 57—34 AT **15 Claims**



1. A method for manufacturing communication cable which is made up of at least two layers of twisted cable units comprising the steps of:

a. twisting a plurality of stranding elements to form a plurality of cable units, each having an SZ twist in essentially identical separate twisting devices in which the stranding elements are formed into a strand which is held in a stretched condition between a fixed entrance point and a fixed exit point, said twist-device having a twisting head which grasps the strand perpendicular to its axis between said entrance and exit points with said twisting head arranged so that the distance between the exit point and the point of attack of the twisting head is smaller than the distance between the point of attack of the twisting head and the entrance point;

b. twisting the units so formed in series therewith to form a twisted group; and

c. switching the process parameters affecting the twisting of the strand of every other twisting device forming said units at the same time at intervals which are smaller than three times the time required for a length element of strand to move from the first fixed point to the twisting head at one of a rate and a phase which is different from the switching of the remaining twisting devices.

2. Apparatus for forming a twisted communication cable comprising:

a. a plurality of SZ twisting devices each having a first fixed entrance point wherein a plurality of elements are formed into a strand and held in a stretched manner between said first fixed point and a second fixed exit point with a twisting head between said first and second fixed points with the distance between the point of attack of said twisting device and said exit point smaller than the distance between said point of attack and the entrance point, said

twisting head being such as to surround its respective strand gripping said strand in a circumferential direction;

b. first means to twist a first plurality of the units formed by said twisting devices into a first group;

c. second means having a twisting axis coincident with the first means to twist a second plurality of said units in a second layer over said first group; and

d. wherein the twisting devices associated with each of said first and second means for twisting are arranged in planes perpendicular to the axes thereof.

3,884,026

METHOD AND APPARATUS FOR EFFECTING REPLACEMENT OF CANS IN SPINNING FRAME

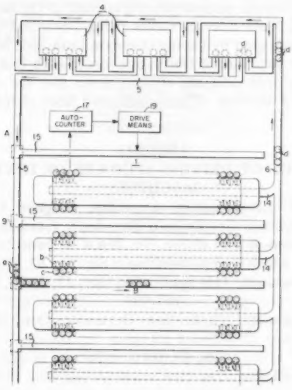
Toshio Yoshizawa, Chiryu; Yasuo Yamada, and Toshinori Taniguchi, both of Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Oct. 12, 1973, Ser. No. 406,177

Claims priority, application Japan, Oct. 19, 1972, 47-104734

Int. Cl. D01h *9/00*

U.S. Cl. 57—34 R **8 Claims**



4. An apparatus for replacement of cans in a spinning frame of the type in which slivers contained in the cans are directly supplied to lined up spinning units of the spinning frame, said apparatus comprising at least one first space for allowing the cans to be disposed in paired inside and outside rows along the length of the spinning frame, the cans in the inside row containing about half as much slivers as the cans in the outside row, a second space for allowing a row of cans full of slivers to be disposed backwardly of the outside cans therealong, the number of the full cans corresponding to that of the cans in one of the inside and outside rows, a third space provided in the lower part of the spinning frame for allowing the cans in the inside row to be received therein, said third space including a movable carrying out means arranged inside the inside row of the cans to extend along and out of the spinning frame, whereby the replacement of the cans is carried out by moving the inside cans in said first space onto said movable carrying out path of said third space after piecing the slivers in the full cans of said second space with the slivers in the cans in the inside row of said first space as the inside cans are ready to empty, moving the outside cans inwardly into the inside row within said first space, and moving the full cans of said second space inwardly into the outside row of said first space.

3,884,027

CLEANING ACCESS AND BRAKING MECHANISM FOR OPEN END SPINNING MACHINES

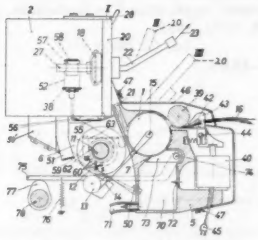
Fritz Schumann, Ingolstadt; Hans Landwehrkamp, Gerolfing, and Kurt Veit, Ingolstadt, all of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Filed Jan. 2, 1973, Ser. No. 320,198

Claims priority, application Germany, Jan. 7, 1972, 2200686

Int. Cl. D01h *11/00, 1/12*

U.S. Cl. 57—56 **7 Claims**



1. An open end spinning machine having a spinning station including a spinning chamber, comprising a sliver intake device having a supply roller and a cooperating pressure member, means mounting said supply roller in a fixed position, a fiber resolving device, a housing for mounting said pressure member and said fiber resolving device, and means for moving said housing toward and away from said supply roller.

3,884,028

APPARATUS FOR REMOVING IMPURITIES FROM FIBERS

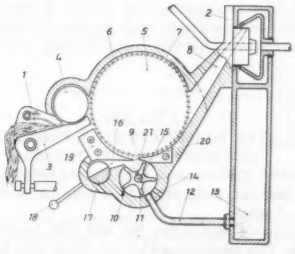
Fritz Stahlecker, Josef-Neidhart Str. 18, D-7341 Bad Ueberkingen, and Hans Stahlecker, Haldenstr., D-7334 Sussen, both of Germany

Filed June 11, 1973, Ser. No. 368,908

Claims priority, application Germany, June 28, 1972, 2231578

Int. Cl. D01h *11/00, 1/12*

U.S. Cl. 57—56 **23 Claims**



1. An apparatus for removing impurities from fibres, said fibres being advanced to a spinning turbine of an open-end spinning unit in a disentangled state, the apparatus comprising: means for transporting the disentangled fibres, an opening for removing the impurities provided in said means for transporting the disentangled fibres, mechanical conveying means for removing the impurities including at least one movably mounted conveying element located directly next to said opening for receiving the impurities and conveying the same away from said opening, and a pneumatic conveying means

connected to said at least one mechanical conveying element for removing and conveying the impurities away therefrom.

3,884,029

APPARATUS FOR RINGLESS SPINNING OF FIBRES

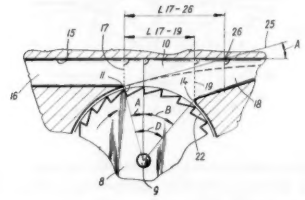
Josef Ripka; Jan Junek, both of Usti nad Orlici; Vaclav Vobornik, Letohrad; Ludmila Lihtarova, Usti nad Orlici; Frantisek Hortlik, Usti nad Orlici; Vaclav Brynda, Usti nad Orlici; Vladimir Ohlidal, Usti nad Orlici; Zdenek Korbar, Usti nad Orlici, and Milos Vecera, Usti nad Orlici, all of Czechoslovakia, assignors to Vyzkumny ustav Bavlinarsky, Usti nad Orlici, Czechoslovakia

Filed June 6, 1973, Ser. No. 367,419

Claims priority, application Czechoslovakia, June 8, 1972, 3963; June 8, 1972, 3965

Int. Cl. D01h *1/12*

U.S. Cl. 57—58.91 **13 Claims**



1. In a ringless spinning machine, a combination comprising a housing having a hollow; a combing roller mounted in said hollow for rotation and having a covering which defines with a wall bounding said hollow a fiber channel and a doffing zone having an outlet and a separating edge at said outlet adjacent said roller; a spinning chamber having an inlet; admitting means including an inlet channel for admitting fibers to be combed into contact with said covering for combing by said roller during travel with the same in said channel; and means for effecting doffing of said fibers from said roller in said doffing zone in such a manner that said fibers travel in a centrifugal trajectory through said doffing zone toward said inlet, the magnitude of an angle A included between an imaginary tangent to said covering at the point where the fibers are doffed from said roller and the wall bounding said hollow opposite the covering being in the range of 0° – 20°, and an angle B being included between an imaginary line that passes through the axis of rotation of said roller and through said separating edge and another line normal to the axis of said inlet channel and passing through the axis of rotation of said roller, the sum of said angles A and B being at least equal to 50°.

3,884,030

FIBRILLATED FOAMED TEXTILE PRODUCTS AND METHOD OF MAKING SAME

Samuel Baxter, Penhow, and John Harold Gilbert, Chepstow, both of England, assignors to Monsanto Chemicals Limited, London, England

Continuation-in-part of Ser. No. 468,269, June 30, 1965, abandoned. This application Oct. 15, 1965, Ser. No. 496,377

Claims priority, application United Kingdom, July 17, 1964, 29324/64; Nov. 30, 1964, 48527/64; Oct. 28, 1964, 43936/64; Dec. 1, 1964, 48726/64

Int. Cl. D02g *3/06;* **B29d** *27/00;* **B32b** *5/18*

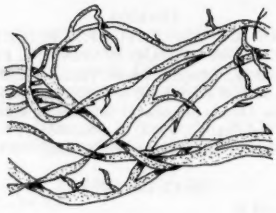
U.S. Cl. 57—140 R **16 Claims**

1. An extruded thermoplastic yarn comprising a network of randomly interconnected fibre elements generally residing longitudinally with respect to the direction of extrusion, said fibre elements being branched and being interconnected by having common branches and at least portions of said fibre elements having a trilobate construction in cross-section with respect to the direction of extrusion said branched fibre elements and said trilobate construction being formed by the breaking down of an extruded and drawn cellular foam rod-shaped material, said rod shaped material being drawn in the direction of extrusion.

16. A process for manufacturing a fibrous product comprising the steps of:

a. forming a cellular thermoplastic structure with the cells having been formed by the expansion of a blowing agent;

b. drawing said cellular thermoplastic structure at a ratio



of at least about 3:1 to orient said structure and increase its longitudinal strength relative its transverse strength; and

c. forming a network of spaced apart and interconnected fiber elements generally being aligned in the direction of drawing, said fiber elements being branched and being interconnected by having common branches, by subjecting said structure to fibrillating forces such that the walls defining said cells are broken down and are converted into said network of interconnected fiber elements.

3,884,031

METHOD OF DRIVING SPINDLES OF TEXTILE MACHINES

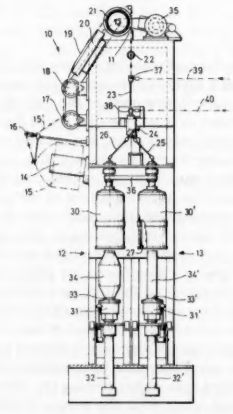
Horst Wolf, Albershausen, Germany, assignor to Zinser-Textilmaschinen Gesellschaft, Ebersbach, Germany

Continuation-in-part of Ser. No. 266,478, June 26, 1972, abandoned, which is a continuation of Ser. No. 82,774, Oct. 21, 1970, abandoned. This application Oct. 23, 1973, Ser. No. 408,999

Claims priority, application Germany, Oct. 21, 1969, 1952909

Int. Cl. D01h *1/26*

U.S. Cl. 57—156 **1 Claim**



1. In a method of driving spindles of a textile machine being of the type which has a plurality of yarn delivery stations and a winding station spindle pair associated with each yarn deliv-

ery station, each spindle being provided with its own variable rpm drive motor, during any operational period one spindle of said spindle pair being the winding spindle on which a yarn package is being formed, while simultaneously the other spindle of the same spindle pair being the idling spindle, the role of these two spindles being exchanged upon redirecting the yarn from one spindle to the other, the improvement comprising the steps of:

A. driving the idling spindle at a maximum given standby rpm during all operating periods for the purpose of allowing the idling spindle to take over the winding function upon the occurrence of yarn breakage during winding on the winding spindle; and

B. driving the winding spindle with a decreasing rpm as a function of winding parameters;

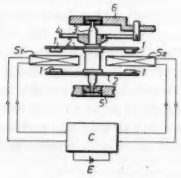
whereby the idling spindle is ready to take over the winding function without delay at all operating times including times of yarn breakage.

3,884,032

DRIVING CIRCUITS FOR ELECTRONIC CLOCKS AND WATCHES

Toyoji Kanazawa, Tachikawa, and Makoto Yoshida, Tokorozawa, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed July 31, 1973, Ser. No. 384,388
Claims priority, application Japan, Aug. 10, 1972, 47-79519
Int. Cl. G04c *3/04;* **H01h** *47/24;* **H03b** *5/36*
U.S. Cl. 58—23 A **8 Claims**



1. An electromechanical driving circuit for use in electronic clocks and watches comprising an oscillatory moving body, a plurality of permanent magnets secured to said oscillatory moving body at its diametrically opposite parts, two coils S_1 and S_2 each arranged between said permanent magnets and adapted to be moved relative to said permanent magnets, which comprises first transistors with emitters earthed and collectors connected to said coils S_1 and S_2, respectively, and a condenser Ca operatively connected through second transistors to junction points between the collectors of said first transistors and said coils S_1 and S_2, respectively, and adapted to be supplied with an electric current relating to induced voltages produced in said coils S_1 and S_2, whereby said first transistors are made alternately conductive in response to said electric current.

3,884,033

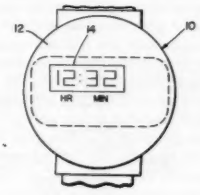
SWITCH FOR ELECTRONIC WATCH

John R. Wood, San Jose, Calif., assignor to American Micro-Systems, Inc., Santa Clara, Calif.

Filed Oct. 17, 1973, Ser. No. 407,147
Int. Cl. G04c *3/00;* **G04b** *19/30, 27/00*
U.S. Cl. 58—23 R **13 Claims**

1. An electrically operated timepiece comprising a plurality of components including a mounting board, an electrical circuit means fixed to said board, an oscillator means and a battery connected to said circuit means, and a housing means for supporting said components therein including front and rear wall members with a display means displaying at least hours and minutes mounted in said front wall member and connected to said circuit means,

switch means situated in said rear wall member and connected therethrough to said circuit means for setting the hours and minutes on said display means, said switch means comprising a thin disk-like body forming a relatively shallow recess and extending inwardly from one of said wall members, said body having a planar bottom portion with a plurality of spaced apart terminals thereon



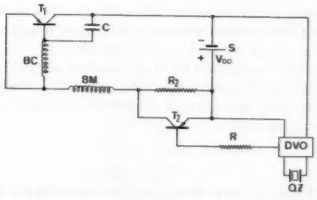
each connected by conductors through said bottom portion to said circuit means, a rotatable actuator disk supported within said shallow recess with contact means on its underside for contacting individual terminals and interconnecting preselected pairs of terminals in different combinations when the disk is placed in various rotational positions for thereby controlling said display means.

3,884,034

QUARTZ SYNCHRONISED CLOCKWORK

Jacques J. G. Dietsch, Paris, France, assignor to Societe Anonyme des Establissements Leon Hatot, Paris, France

Filed Oct. 10, 1973, Ser. No. 404,916
Claims priority, application France, Oct. 11, 1972, 72.35957
Int. Cl. G04c *3/04;* **H03b** *5/36*
U.S. Cl. 58—28 A **7 Claims**



1. Apparatus for controlling a clockwork movement incorporating a balance and a driving winding receiving electric maintenance impulses to co-operate with a magnetic element of the balance to maintain oscillation of the balance with a normal amplitude at a predetermined maintenance frequency, said apparatus comprising a quartz oscillator operatively associated with a frequency dividing circuit having an output supplying electric reference impulses at a reference frequency differing slightly from the predetermined maintenance frequency, and gating means operatively connected to said output to modify the amplitude of each maintenance impulse if and so long as it overlaps with a reference impulse, and thereby adjust the actual frequency of oscillation of the balance to make it equal to the reference frequency.

3,884,035
CHRONOGRAPH WATCH

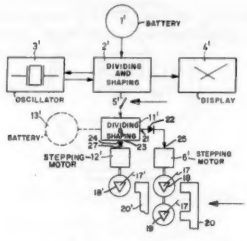
Pierre Maurice Jeannet, Chambrelien, and Michel Girardin, La Chaux-de-Fonds, both of Switzerland, assignors to Societe Suisse pour l'Industrie Horlogere Management Services, S.A., Bienne, Switzerland

Filed Oct. 15, 1973, Ser. No. 406,204

Claims priority, application Switzerland, Oct. 13, 1972, 15051/72

Int. Cl. G04f *3/06, 7/04*

U.S. Cl. 58—39.5 **9 Claims**



1. A chronograph watch, comprising:

a quartz oscillator;

a first electronic circuit coupled to said oscillator for dividing and shaping output pulses generated by said oscillator;

display means connected to a first output of said first electronic circuit for displaying a time signal;

a second electronic circuit comprising a frequency divider and an output pulse shaper;

switch means connected between an input of said second electronic circuit and a second, independent output of said first electronic circuit;

a stepping motor connected to an output of said second electronic circuit and driven at a predetermined frequency by pulses produced by said second electronic circuit;

a gear train comprising a motor pinion driven by said motor and counter wheels comprising at least a second counter wheel and a minute counter wheel;

cam means mounted on said counter wheels; and

hammer means mounted adjacent said cam means for resetting said counter wheels to zero upon engagement of said cam means by said hammer means;

the frequency produced at said second output being at least eight times greater than the frequency produced at said output of said second electronic circuit for driving said stepping motor.

3,884,036
STEAM PLANT WITH PRESSURE-FIRED BOILER

Hans Pfenninger, Baden, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

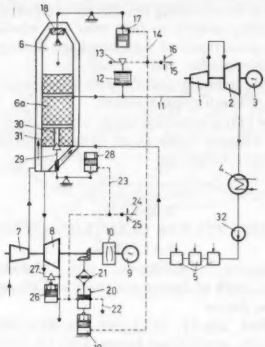
Filed Nov. 27, 1973, Ser. No. 419,276

Claims priority, application Switzerland, Dec. 1, 1972, 17481/72

Int. Cl. F02c *9/02;* **F01k** *23/00*

U.S. Cl. 60—39.18 B **3 Claims**

1. A combined steam and gas turbine plant comprising a pressure-fired boiler providing steam for driving a steam turbine coupled to a power consumer such as an electrical generator, means including a condenser at the discharge side of said steam turbine for converting the discharged steam into feed water and a return line for the feed water to the inlet side of said boiler for re-cycling, a heat exchanger for pre-heating the returned feed water by heat exchange with combustion gas at the gas discharge side of said boiler, a by-pass for the combustion gas passing through said heat exchanger, valve means for controlling said by-pass, the respective portions of the combustion gas put through said by-pass and through said heat exchanger being combined at the outlet thereof and delivered to the inlet of a gas turbine at a temperature variable in accordance with the portion of the gas put through said by-pass and constituting the sole motive fluid for driving said gas turbine, a live-steam regulator responsive to a change in load on the power plant for correspondingly regulating the fuel supply to



said boiler and for regulating said valve means which controls the by-pass to said feed water heat exchanger thereby to increase or decrease, respectively the temperature of the discharged combustion gas and thereby increase or decrease, respectively the speed of the gas turbine and air compressor coupled thereto in dependence upon the sense of the change in load on the power plant so as to maintain a match between the required power input to said gas turbine and the required pressurized air output from said compressor.

3,884,037
INTERNAL COMBUSTION ENGINE SYSTEM FOR EXHAUST EMISSIONS CONTROL UTILIZING AN ACOUSTIC CATALYTIC MUFFLER

Everett M. Barber; John T. Brandenburg, both of Wappingers Falls, and Richard A. Frost, Holmes, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 817,599, Feb. 17, 1969, abandoned, which is a division of Ser. No. 368,951, May 20, 1964, Pat. No. 3,495,950. This application May 13, 1971, Ser. No. 143,236

Int. Cl. F01n *3/14*

U.S. Cl. 60—292 **9 Claims**

1. In combination, an internal combustion engine having a cylinder, means for reducing the amount of pollutants including residual combustibles among the exhaust emissions from said cylinder comprising an exhaust system leading from an exhaust port of said cylinder, means for providing air in at least stoichiometric ratio adjacent and downstream of said exhaust port for combustion of said residual combustibles among said exhaust emissions in said exhaust system, means for controlling the back pressure in said exhaust system comprising valve means positioned therein downstream from said exhaust port functioning to restrict mass flow at the lower engine speeds above idle thereby to maintain a back pressure higher than the normal back pressure of said exhaust system without said valve means and opening at the higher speeds and mass flow rates when said normal back pressure without said valve means is above the imposed back pressure, and the improvement comprising an acoustic catalytic muffler construction located upstream and adjacent said valve means, said acoustic catalytic muffler construction comprising a casing having an inlet and an outlet and an annular mass of material within said casing, said mass of material supporting a catalyst compound for reducing the amount of pollutants

among said exhaust emissions from said cylinder, said inlet of said catalytic muffler construction and said outlet thereof each having a diameter substantially equal to the inner diameter of said annular mass of material and all being located for throughflow of said exhaust emissions through said muffler construction, said annular mass of material being comprised of a plurality of fibrous sections having a general helical configuration, adjoining sections having contrasting helix angles.

3,884,038

CONTROL SYSTEM FOR A PRIME MOVER CONNECTED TO A STEPLESS TRANSMISSION

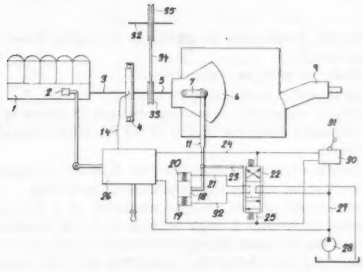
Franz Forster, Haibach, and Hans-Waldemar Stuhr, Aschaffenburg, both of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Jan. 30, 1974, Ser. No. 437,885

Claims priority, application United Kingdom, Feb. 2, 1973, 5287/73

Int. Cl. F16h *39/46*

U.S. Cl. 60—431 **25 Claims**



1. A system comprising a prime mover having an output shaft; a steplessly adjustable transmission having an input shaft operatively connected to said output shaft of said prime mover, and an output shaft operatively connectible to a load, and control means for varying the speed ratio between the input and output shafts of said transmission; torque-measuring means between said prime mover and said transmission for directly detecting the torque at the output shaft of said prime mover; and means responsive to the torque-measuring means for operating said control means upon the measured torque attaining a predetermined limiting value to reduce the speed of the output shaft of said transmission.

3,884,039

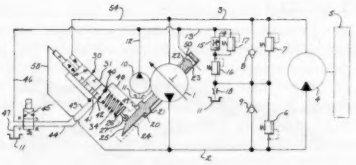
HYDRAULIC PUMP WITH HORSEPOWER LIMITER

Reza Pourian, Wauwatosa, Wis., assignor to The Oilgear Company, Milwaukee, Wis.

Filed May 20, 1974, Ser. No. 471,606

Int. Cl. F16h *39/46*

U.S. Cl. 60—445 **9 Claims**



1. A hydraulic transmission comprising a variable displacement pump hydraulically connected to a hydraulic motor, an auxiliary pump to provide control pressure fluid;

said variable displacement pump having a displacement control member, opposed cylinder and pistons subject to control pressure fluid for positioning said displacement member;

said opposed cylinders and pistons comprising a bias cylinder connected to the auxiliary pump, a control cylinder having a larger area piston than said bias cylinder;

a pilot operated valve assembly comprising:

a pilot operated valve having a control port connected to said control cylinder, a first port connected by a reversing valve to a delivery port of the auxiliary pump and a second port connected by said reversing valve to a return for said auxiliary pump for effecting a deceleration mode of operation of the transmission, said control port normally being slightly open to said second port, means for shifting said reversing valve to reverse its connections to the first and second ports for effecting an acceleration mode of operation of the transmission, a movable valve member normally operable to control the opening of the control port with said second port, a follow-up spring acting between said valve member and one of said pistons positioning the displacement member whereby the bias force of said spring on said valve member is decreased with increase in pump displacement above a predetermined value,

a tandem arrangement of pilot cylinders and plungers in line with said valve member for acting on one another and for urging said valve member against said spring, said arrangement comprising an acceleration control plunger, a release plunger, a two-part deceleration control plunger, and said valve member, a port at the end of said acceleration control plunger connected to a delivery port of said pump, a port between said two-part deceleration control plunger connected to an inlet port of said pump, a port between said release plunger and said deceleration control plunger and a port between said deceleration control plunger and said valve member each connected to said first port of said pilot valve.

3,884,040

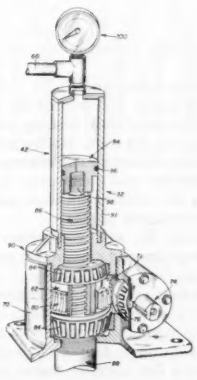
HYDRAULIC ACTUATOR

Lane A. Green, Shreveport, La., assignor to Superior Iron Works & Supply Company, Inc., Shreveport, La.

Filed Feb. 26, 1973, Ser. No. 335,544

Int. Cl. F15b *7/08*

U.S. Cl. 60—593 **6 Claims**



1. A hydraulic actuator for facilitating precise control over an apparatus to perform a function by means of the action of pressurized hydraulic fluid outside said actuator which comprises:

a housing with a hydraulic cylinder rigidly attached thereto, said hydraulic cylinder including a piston mounted for relative reciprocation to selectively cause hydraulic fluid flow to and from the apparatus;

operator means; and

a mechanism having a relatively high mechanical advantage for effecting relative reciprocation of the piston in response to actuation of the operator means so that a relatively substantial actuation of the operator means is required in order to effect a relatively small change in the performance in the function by the apparatus.

3,884,041

GAS TURBINE

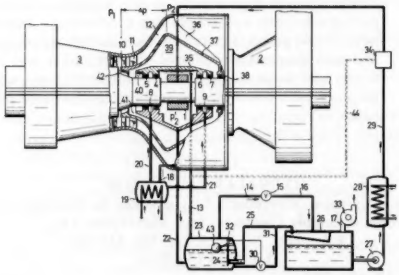
Ferdinand Zerlauth, Andelfingen, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Nov. 6, 1973, Ser. No. 413,312

Claims priority, application Switzerland, Nov. 8, 1972, 16247/72

Int. Cl. F02g *7/06, 7/28*

U.S. Cl. 60—657 **4 Claims**



1. A gas turbine comprising

a compressor having a flow duct for a gaseous working medium, a terminal rotor blading ring in said flow duct and an adjacent exit stator blading ring in said flow duct;

a turbine downstream of said compressor;

a diffuser between said compressor and said turbine for conducting the working medium and air between said compressor and said turbine;

a rotor bearing for said compressor and said turbine mounted between said compressor and said turbine;

a casing housing said rotor bearing;

contactless seals in said casing sealing said bearing from the ambient zone outside said housing;

a tapping duct connected between an exit end of said diffuser and said seals to deliver a flow of barrier medium to said seals at a first pressure higher than in said ambient zone; and

means defining a return flow path between said casing and said compressor flow duct to conduct the barrier medium from said seals into said flow duct at a pressure lower than said first pressure and at a point between said blading rings.

3,884,042

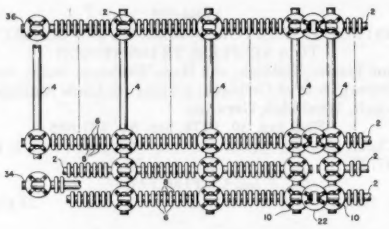
FLOATING BREAKWATER

Thomas R. Anderson, Stanwood, and Edwin E. Fortner, Everett, both of Wash., assignors to Cascade Pacific Rim Co., Inc., Arlington, Va.

Filed Jan. 2, 1974, Ser. No. 429,707

Int. Cl. E02b *3/06*

U.S. Cl. 61—5 **13 Claims**



1. A floating breakwater to attenuate damaging wave action, comprising:

a first floatable elongated member,

a second floatable enlongated member,

a plurality of outwardly extending resilient elements spacedly mounted along the length of the floatable elongated members,

hinge means interconnecting the two floatable elongated members in an end-to-end relationship, including

first and second sets of flexible elements of a frictional material, such that a high friction force is generated between the floatable elongated member and each flexible member, secured to the respective adjacent ends of two confronting floatable elongated members with the flexible elements of each set lying on the opposite sides of the floatable elongated member,

means extending through the flexible elements of each set clamping them about the respective floatable elongated member, said means being spaced out of contact with the floatable elongated members,

means flexibly interconnecting the adjacent first and second sets of flexible members and secured thereto, and

means anchoring the end of the interconnected floatable elongated members whereby waves contacting the breakwater sections will be attenuated and the sections are capable of relative movement and yet are rugged.

3,884,043

ARTIFICIAL ISLAND

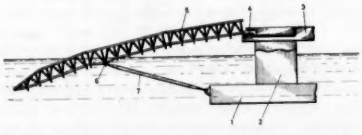
Wilhelmus Jan Timmermans, Hellevoetsluis, Netherlands, assignor to R. J. Brown & Associates Corporation, Fribourg, Switzerland

Filed Jan. 16, 1974, Ser. No. 433,761

Claims priority, application Netherlands, Jan. 19, 1973, 7300821

Int. Cl. F16l *1/00;* **B63b** *35/04*

U.S. Cl. 61—72.3 **3 Claims**



1. An artificial island with carriers intersecting the water line and a platform on said carriers, an elongated stinger for lowering a pipeline, one end of the stinger being connected to a guide member, means mounting said guide member for movement over the platform in the direction of the length of

the stinger, a support connected to the stinger intermediate the ends of the stinger, the support being pivotally mounted on the island below the water line.

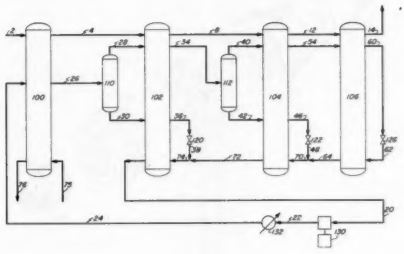
3,884,044
MIXED REFRIGERANT CYCLE

Sheldon Bodnick, Rockaway, and Thomas M. Stark, Morristown, both of N.J., assignors to Exxon Research & Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 9,499, Feb. 9, 1970, abandoned. This application Nov. 6, 1972, Ser. No. 304,276

Int. Cl. F25j *3/00*

U.S. Cl. 62—9 **8 Claims**



1. A method of cooling and liquefying natural gas in a warm stage by a first refrigeration system employing a first refrigerant and thereafter further cooling and liquefying said natural gas in a cold second stage by a second refrigeration system employing a multicomponent second refrigerant, each of said first and second refrigeration systems discharging heat received from said cooling and liquefying of natural gas in said associated first and second stages by compressing said refrigerants and condensing them by indirect heat exchange against environmental cooling streams comprising the steps of:

a. precooling said natural gas to essentially ambient temperature by indirect heat exchange against at least one of the group of environmental cooling streams consisting of air and water and thereafter;

b. cooling below ambient temperature in said warm first stage by indirect heat exchange said natural gas and independent therefrom said multicomponent second refrigerant by said first refrigerant which exits said first stage after being warmed therein and after being compressed is cooled by one of the group of environmental streams consisting of air and water, thereby rejecting heat received from the natural gas and the second refrigerant in said first stage to the environment and is expanded and returns to said warm first stage as refrigerant;

c. further cooling and liquefying said natural gas in said cold second stage by indirect heat exchange with said multicomponent second refrigerant which thereafter exits said cold second stage after absorbing heat therein at a temperature below that of said natural gas entering said cold stage and enters the second refrigeration system compressor suction at substantially its exit temperature and pressure and thereafter is compressed and cooled to near ambient temperature; thereby rejecting heat absorbed in said second stage by indirect heat exchange against at least one of the group of environmental streams consisting of air and water and thereafter is cooled below ambient temperature in said warm first stage of (b) and thereafter separated into liquid and vapor phases and is returned to said cold second stage wherein said liquid phase is cooled and thereafter reduced in pressure, and returned through said second stage as a portion of said second refrigerant and said vapor phase is cooled.

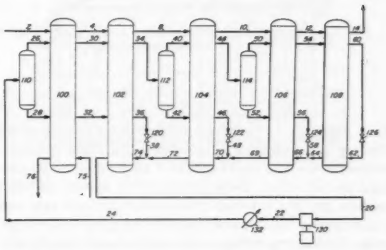
3,884,045
MIXED REFRIGERANT CYCLE

Thomas M. Stark, Morris Township, and Sheldon Bodnick, Rockaway, both of N.J., assignors to Exxon Research & Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 9,500, Feb. 9, 1970, abandoned. This application Nov. 24, 1972, Ser. No. 309,341

Int. Cl. F25j *3/00*

U.S. Cl. 62—9 **8 Claims**



7. The method of claim **6** wherein said first refrigerant substantially comprises propane.

3,884,046
CRYSTALLIZATION OF A FATTY COMPONENT FROM A FEED BY THE STEPS OF EMULSIFICATION WITH A SURFACTANT, COOLING BY VACUUM EVAPORATION AND SUBSEQUENT CONVENTIONAL SEPARATION

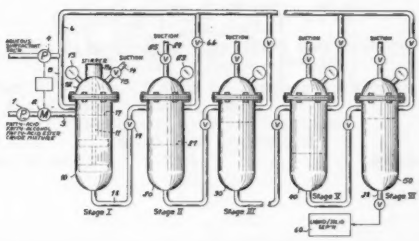
Hans Joachim Schmidt, and Albert Hartmann, both of Frankfurt am Main, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 26, 1970, Ser. No. 38,606

Claims priority, application Germany, Mar. 26, 1969, 1915298

Int. Cl. E01d *9/04*

U.S. Cl. 62—58 **9 Claims**



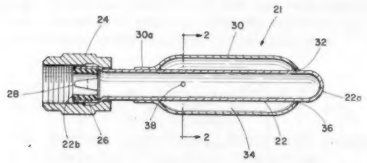
1. A method of separating and recovering at least one crystallizable component of an organic phase containing at least one fatty acid, fatty alcohol or fatty-acid ester which comprises the steps of emulsifying said organic phase in a molten state in a surfactant-containing liquid aqueous phase to form an emulsion in which said component is at least in part a disperse phase; cooling said emulsion after the interaction of said organic phase with the surfactant-containing liquid phase by subjecting same to suction to evaporate water from said emulsion, thereby crystallizing said component from said emulsion and forming a dispersion of the crystallized component in the liquid; and recovering said crystallized component in the form of crystals from said dispersion.

3,884,047

REFRIGERANT CHARGING METHOD AND APPARATUS

Wendell E. Maudlin, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 28, 1973, Ser. No. 429,429
Int. Cl. F25b *45/00*
U.S. Cl. 62—77 2 Claims



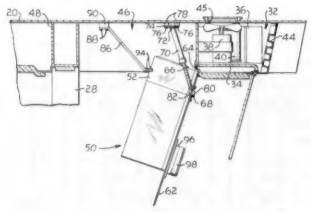
1. A method of charging a refrigeration system of the type including a compressor, a condenser, a fixed restriction expansion device and an evaporator all connected to provide a closed circuit, vapor cycle refrigeration system and including a suction gas line between said evaporator and said compressor comprising the steps of: initially charging said refrigeration system by adding refrigerant thereto until a slightly overcharged condition exists; providing a target into which bleed-off liquid refrigerant may be conducted from said suction gas line to said target, thereby indicating the overcharged condition; continuing to bleed-off liquid refrigerant until the frost on said target is completely melted, thereby indicating a superheated condition of suction gas; discontinuing the bleed-off of refrigerant when a predetermined time has elapsed after all frost has been melted, said predetermined time being sufficient to insure 5°–10°F of superheat.

3,884,048

AIR CONDITIONING EVAPORATOR MODULAR SUPPORT AND LOWERING MEANS

Marvin L. Schneider, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 15, 1974, Ser. No. 488,742
Int. Cl. F25d *19/00*
U.S. Cl. 62—298 8 Claims



1. A pivotal mounting assembly for mounting an air conditioner unit in the operator compartment of a vehicle for supporting said unit in a first position for normal use and swinging said unit to a second position for servicing, comprising in combination:

an enclosed vehicle operator compartment having a generally horizontally extending roof and a plurality of downwardly depending side walls;

a stationary mounting member secured to said compartment;

a pivotal mounting member pivotally secured to said stationary member and supporting an air conditioning unit mounted thereon;

extensible jack means pivotally secured at one end to said operator compartment and pivotally secured at the other end to said pivotal mounting member, said jack being operative to move said air conditioner unit between said first and said second positions; and

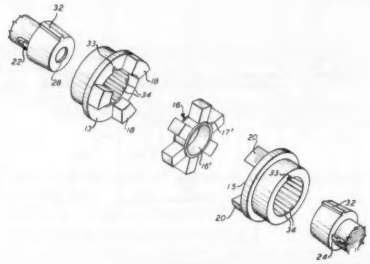
means for securing said pivotal bracket and said air conditioning unit in said first position.

3,884,049

DRIVE COUPLING

Ernest H. Pauli, Watchnung, N.J., assignor to The Hilliard Corporation, Elmira, N.Y.

Filed Sept. 5, 1972, Ser. No. 286,346
Int. Cl. F16d *3/64*
U.S. Cl. 64—14 7 Claims



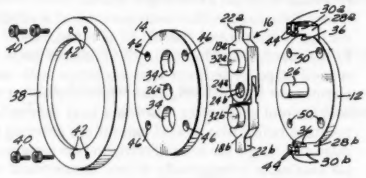
1. A flexible coupling device forming a drive coupling between two shafts in adjacent substantially axially aligned relation comprising a removable bushing member on the adjacent end(s) of each of said shafts, each bushing member having a uniform diameter, inner shaft receiving bore and means fixing its relative axial movement (thereon) on its shaft and an outer cylindrical surface tapered outwardly from the end(s) of said shaft(s), and coupling head members mounted on each of said bushings having longitudinally projecting portions extending toward one another and in overlapping relation to provide a torque transmitting drive connection, said coupling heads having inner tapered cylindrical bores substantially mating with and received respectively on said tapered bushing surfaces.

3,884,050

FORCE TRANSMITTING COUPLING

Louis J. Borcuk, Riverside, Calif., assignor to Louis J. Borcuk and Joseph J. Borcuk, both of Riverside, Calif.

Filed Dec. 17, 1973, Ser. No. 425,510
Int. Cl. F16d *3/54*
U.S. Cl. 64—19 10 Claims



1. A force transmitting coupling comprising:

a rotatable plate having a central part and distal force transmitting means;

linkage means including a link pivotally connected to said part and engaged by said force transmitting means;

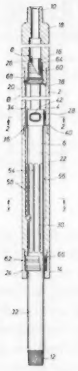
a force transmitting member carried by said link and located intermediate said central part and associated distal force transmitting means; and

an apertured plate having an opening in which the force transmitting member is received.

3,884,051
BEARING STRUCTURE FOR TELESCOPING WELL TOOL

Clifford C. Bottoms, 12644 Cathy St., Sylmar, Calif. 91342

Filed Mar. 12, 1973, Ser. No. 340,280
Int. Cl. F16d *3/06*
U.S. Cl. 64—23.7 **6 Claims**

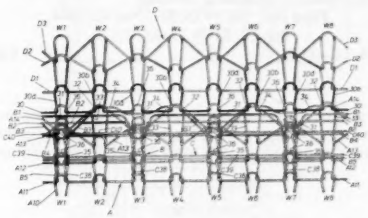


1. A well tool for use within a hole, said tool comprising:
an elongated outer member having a longitudinal bore therethrough, and having a first end and a second end;
an elongated inner member telescopically mounted in the bore of said outer member, said outer member being axially movable relative to said inner member, said inner member having a first end located within the bore of said outer member axially inwardly of the first end of said outer member, and a second end located free of the bore of said outer member and axially outboard of the second end of said outer member;
means limiting axial movement of said outer member relative to said inner member in either direction;
a radial bearing for maintaining axial alignment of said inner and outer members, said bearing comprising a plurality of rotating bearing elements circumferentially disposed between and engageable with said inner and outer members, each of said bearing elements having an axis of rotation disposed in a plane normal to a longitudinal axis of said inner member and located in part between said axis and the inner wall of said outer member, the axes of said bearing elements being fixed with respect to one of said members; and
longitudinally extending spline means cooperative between said inner and outer members to permit relative axial movement between said members within the limits of said limiting means and prevent relative rotation between said members.

3,884,052
TUBULAR KNITTED FABRICS

Peter Michael Findlay; William Ewart Alan Shelton, and John Michael Klee, all of Leicester, England, assignors to The Bentley Engineering Co., Ltd., England

Continuation of Ser. No. 111,208, Feb. 1, 1971, abandoned, which is a division of Ser. No. 776,943, Nov. 19, 1968, Pat. No. 3,626,726. This application Apr. 2, 1973, Ser. No. 346,799
Int. Cl. D04b *9/54, 9/56*
U.S. Cl. 66—187 **7 Claims**

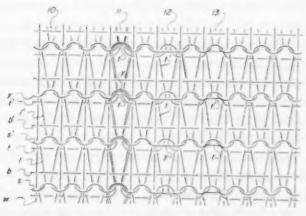


1. A closed knitted fabric tube comprising a first piece of tubular weft knit fabric having at one end a terminal course comprising needle loops, a second separately knit piece of tubular weft knit fabric having at one end a selvage including dial point loops and at the other end a terminal course comprising needle loops, said second piece of tubular fabric being constricted inwardly of its central part to a substantially complete closure, a separately knit course of joining loops interlooping with rows of loops at three different end parts of fabric, namely (1) with needle loops of said terminal course of said first piece of fabric, (2) with dial point loops of said selvage end of said second piece of fabric and (3) with needle loops of said terminal course at said other end of said second piece of fabric so as to join said one end of said first piece of fabric to both ends of said second piece of fabric, said separately knit course of joining loops being the sole connection between said first piece of fabric and said second separate piece of fabric, and a plurality of courses forming a band of anti-ravel fabric extending as a continuation from said source of joining loops, said course of joining loops further interlooping with a first course of said band of anti-ravel fabric.

3,884,053
KNIT FABRIC INCORPORATING A WEFT STITCH WEAVE

Kurt W. Niederer, Charlotte, N.C., assignor to Schlafhorst & Co., Monchen-Gladbach, Germany

Filed Dec. 10, 1973, Ser. No. 423,487
Int. Cl. D04b *23/08, 23/10*
U.S. Cl. 66—192 **8 Claims**



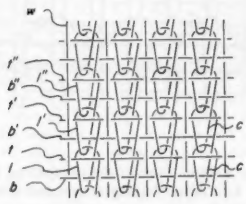
1. In knit fabric incorporating an inlay of spaced warp ends with filling ends laid at opposite sides of the warp ends, the improvement which comprises weft stitch courses having

needle loops knit in wales running in the spaces between said warp ends and interlaced with filling ends at both sides of said warp ends together with connecting sinker loop portions passing to one side of said warp ends without any necessary knitting-in of any of said warp or filling ends.

3,884,054
KNIT FABRIC INCORPORATING A WARP STITCH WEAVE

Kurt W. Niederer, Charlotte, N.C., assignor to W. Schlafhorst & Co., Monchen-Gladbach, Germany

Filed Dec. 10, 1973, Ser. No. 423,484
Int. Cl. D04b *23/08, 23/10*
U.S. Cl. 66—193 **7 Claims**

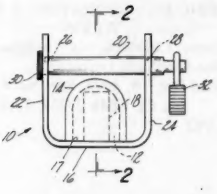


1. In knit fabric incorporating an inlay of spaced warp ends with filling ends laid at opposite sides of said warp ends across the full fabric width and warp knit stitch chains formed in the spaces between said warp ends, an improved woven fabric simulation comprising a sinuous interlacing of loops of said stitch chains with filling ends at both sides of said warp ends by which said filling ends are held against said warp ends and are forced inwardly therebetween so that both warp and filling ends are caused to undulate as a result of mutual interaction in a manner producing an appearance approaching that of a woven structure.

3,884,055
TRAILER HITCH LOCK

Dale F. Vuillemot, 11513 Lewis Rd., Clio, Mich. 48420

Filed Sept. 27, 1973, Ser. No. 401,387
Int. Cl. E05b *73/00*
U.S. Cl. 70—58 **10 Claims**



1. A theft deterrent device to lockably obstruct the socket of a trailer hitch, comprising:

an elongated plate to traverse the opening into said socket;

a plug member disposed to one side of the vertical centerline of said plate and affixed thereto, said plug member fitting within said socket;

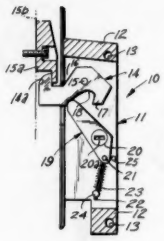
a bar mounted to said device in parallel spaced relationship to said elongated plate and being disposed to the opposite side of the vertical centerline of said plate from that side thereof to which said plug is disposed so that when said theft deterrent device is installed on said trailer hitch said bar is located generally over said trailer hitch, said elongated plate is located under said trailer hitch closing the opening into said socket and said plug member is inserted in said socket, the orientation of said plug and said bar on opposite sides of the vertical centerline of said plate preventing removal of said device by merely rotating said theft deterrent device relative to said hitch; and

means to lock said theft deterrent device to said trailer hitch.

3,884,056
LOCK FOR SLIDING DOORS

Vern A. East, and Ora V. East, both of 920 N. 82nd St. H102, Scottsdale, Ariz. 85257

Filed Oct. 5, 1973, Ser. No. 403,930
Int. Cl. E05b *65/08*
U.S. Cl. 70—100 **6 Claims**



1. A latch mechanism for a slidable door comprising: a hollow body, a latch plate having lip means adapted to releasably grasp a keeper, first pivot means pivotally supporting said latch plate within said body, a lever arm, second pivot means pivotally supporting said lever arm within said body, the axes of the two pivot means being spaced and substantially parallel, said latch plate being defined in part by a peripheral recess generally facing toward said second pivot means and receiving the distal end of said lever arm, said peripheral recess being shaped in such a manner as to form a cam and follower relationship with said distal end of the lever arm so that pivotal movement of said lever arm will cause pivotal movement of said latch plate between a keeper grasping, or latching, position and an unlatching position, said peripheral recess also being shaped such that when the latch plate is in its latching position the lever arm will be in contact with a planar portion thereof, the planar portion lying in a plane containing the axis of said first pivot means and being perpendicular to a second plane containing the axis of said second pivot means and the point of contact of the lever arm with said planar portion, so that all external pressure applied directly to said latch plate in an attempt to pivot it toward its unlatching position will be applied through said lever arm directly to said second pivot means, manually accessible means for pivoting said lever arm, and stop means fixedly carried within said body and limiting pivotal movement of said lever arm in one direction to that position wherein the distal end thereof abuts said planar portion of said peripheral recess of said latch plate.

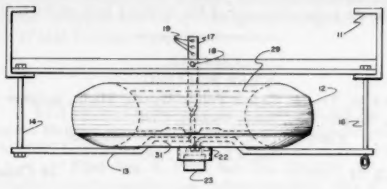
3,884,057
LOCK PROTECTION APPARATUS

Donald L. Maurer, 2125 Petersburg Dr., Milpitas, Calif. 95035

Filed Oct. 29, 1973, Ser. No. 410,439
Int. Cl. E05b *65/12*
U.S. Cl. 70—259 **6 Claims**

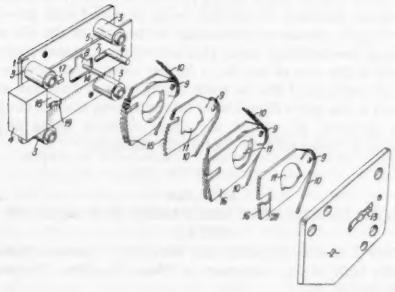
1. A protective apparatus for the bolt of a lock which secures two members together comprising a hasp attached to one member, a base plate attached to the other member, means attached to said base plate formed to mate with said hasp for being secured thereto by the bolt, and a continuous protective wall attached to said base plate and surrounding

said means attached to said base plate, whereby when said hasp is mated with said means attached to said base plate and



secured thereto by the bolt, the bolt is protected from cutting by said protective bulkhead.

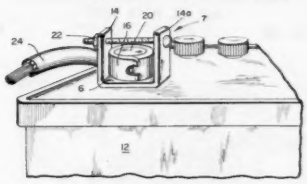
3,884,058
KEY-ACTUATED LOCKS
Peter Alfred Terry, 35 Halcyon Way, Hornchurch, and Ronald Reynolds, 113 Long Green, Chigwell, both of England
Filed Aug. 7, 1973, Ser. No. 386,385
Claims priority, application United Kingdom, July 26, 1973, 37376/72
Int. Cl. E05b *21/00*
U.S. Cl. 70—355 **9 Claims**



1. In a key-actuated lock including: a front plate having a keyhole; a bolt; two stumps spaced apart on said bolt; a first set of pivoted levers, each of the same length and provided with a stump-receiving slot; and a second set of pivoted levers, each of the same length, which is shorter than the length of the first set of levers, and provided with a stumpreceiving slot, the sets of levers being rockable by a correct key located through the said keyhole to align the said slots of the first set of levers to receive one of the said stumps and simultaneously to align the said slots of the second set of levers to receive the other of the stumps whereby the bolt can be withdrawn to release the lock, the improvement consisting in that the stump received in the slots of the second set of levers is masked by the first set of levers when viewed from the front plate.

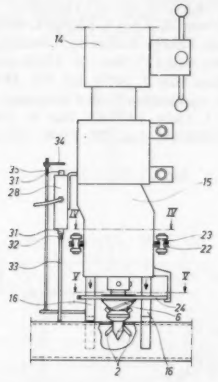
3,884,059
TWIN LOCK KEY TAG
Raymond J. McKee, Box 246, Little Falls, N.J. 07470
Filed Oct. 4, 1973, Ser. No. 403,667
Int. Cl. A44b *15/00*
U.S. Cl. 70—456 R **1 Claim**

1. A key ring comprising a length of rod-like spring material forming a generally annular central portion with opposed end portions coiled against each other, such end portions terminating in spaced free ends and a pair of radially outwardly extending loop projections formed therein in close circumferentially spaced relation to each other, and a member closely receiveable on said ring between said projections for retention by said projections to preclude movement of a mounted key therepast, said member comprising a flat strip of material



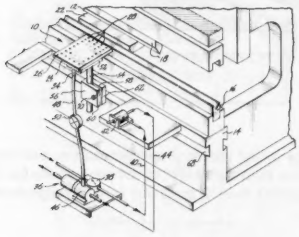
incorporating a ring received aperture at one end thereof of a diameter less than the height of the projections for selective forced movement over at least one of said projections.

3,884,060
AUTOMATIC FLANGING DRILL APPARATUS
Leo Larikka, 01670 Vantaa, Vantaa, Finland
Filed May 30, 1974, Ser. No. 474,659
Claims priority, application Finland, May 30, 1973, 1749/73
Int. Cl. B21d *51/40*
U.S. Cl. 72—23 **8 Claims**



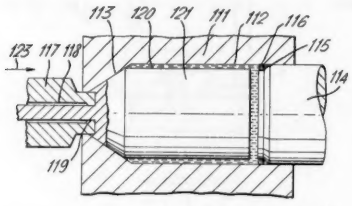
1. Automatic flanging drill apparatus for drilling a hole in the side of a tube and raising a flange (3) encircling the hole, said apparatus comprising a drill bit (1) and flanging means (2) connected with same, which can be made, with the aid of an adjustment means (6), to protrude from the drill bit, after the hole has been drilled, under the edges of the hole, and means (16,17,18) for withdrawing the drill bit and the flanging means (2) from the hole while they are rotating, characterized in that the apparatus comprises a sensing means (33), which observes the position of the drill bit (1) when the flanging means can be pushed in under the edges of the hole, that said sensing means (33) actuates a control valve (28), which on the one hand controls the said adjustment means (24) for causing the flanging means (2) to protrude from the drill bit (1) and which on the other hand engages the action of the said means (16,17,18) for withdrawing the drill bit and the flanging means (2) from the hole.

3,884,061
VACUUM PARTS HOLDER
Marlyn A. Westby, Edmonds, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Nov. 2, 1973, Ser. No. 412,366
Int. Cl. B21b 9/00
U.S. Cl. 72—38 17 Claims



1. A holder of parts to permit forming of the parts in a machine with an operator's hands removed from the vicinity of the forming dies comprising: a flat surfaced holding member having a plurality of openings through the surface that communicate through the member to a vacuum source, means for adjustably positioning the holding member with the flap side up adjacent the stationary dies of the machine, and means for controlling vacuum to the holding member.

3,884,062
FORMING OF MATERIALS
Derek Green, Lytham St. Anne's, England, assignor to United Kingdom Atomic Energy Authority, London, England
Division of Ser. No. 880,127, Nov. 26, 1969, abandoned. This application May 7, 1973, Ser. No. 357,531
Claims priority, application United Kingdom, Sept. 3, 1969, 43716/69; Feb. 11, 1969, 7409/69; Dec. 9, 1968, 58493/68; Jan. 21, 1969, 3489/69; Jan. 29, 1969, 4996/69; Feb. 19, 1969, 9096/69
Int. Cl. B21c 23/08
U.S. Cl. 72—60 16 Claims

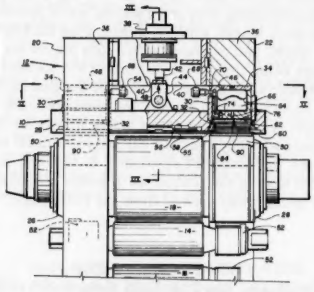


1. A method of producing from a workpiece a product of reduced cross section by extruding through an orifice defining the reduced product cross-section, comprising applying an initial bulk compressive stress to the whole of the workpiece to influence the workpiece to extrude through the orifice and applying a tool having a working face of smaller cross section than the workpiece to a localized region of the workpiece adjacent the orifice, and moving the tool in a repetitive closed cyclic path with the working face of the tool maintained in pressure contact with the localized region of the bulk-stressed workpiece during at least part of the cyclic path to apply an additional compressive stress at said localized region to influence the localized region to extrude through said orifice, so that the material of the workpiece in the localized region forward of the working face of the tool is subjected to an additional compressive stress and is thereby formed through the orifice defining the product cross section under the influence of the bulk compressive stress acting in combination with the additional compressive stress in the material of the workpiece in the region forward of the working face of the tool.

3,884,063
GEAR ROLLING
Richard W. Tersch, Grosse Pointe Woods, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Feb. 28, 1974, Ser. No. 446,625
Int. Cl. B21h 5/00
U.S. Cl. 72—102 26 Claims

1. A gear rolling die for roll finishing gears comprising a gear-like body having teeth generally conjugate to the form required on a work gear, a substantial number of the side surfaces of the die teeth facing in each direction with respect to a given direction of rotation being provided with grooves extending in planes perpendicular to the axis of the die and defining therebetween lands also extending in planes perpendicular to the axis of the die, a further substantial number of the side surfaces of the die teeth facing in each direction with respect to the given direction of rotation being smooth continuous surfaces, all of the die tooth surfaces being either grooved or being smooth continuous surfaces.

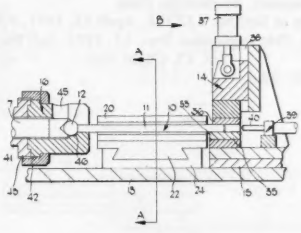
3,884,064
ROLL POSITIONING MECHANISM FOR ROLLING MILLS
Andrew J. Petros, Oakdale, and Ronald D. Pizzedaz, Springdale, both of Pa., assignors to Mesta Machine Company, Pittsburgh, Pa.
Filed Jan. 28, 1974, Ser. No. 437,180
Int. Cl. B21b 31/32
U.S. Cl. 72—245 19 Claims



1. In a rolling mill, the combination comprising a mill stand housing construction, at least two mill rolls slidably mounted in window means of said housing construction, said mill rolls having bearing chocks mounted adjacent each end thereof, a pair of roll positioning cylinder and plunger arrangements respectively spanning gaps between the roll chocks of an adjacent one of said mill rolls and juxtaposed end portions of said mill housing construction, hydraulic circuits for extending said cylinder and plunger arrangements for bearing engage-

ment with said bearing chocks and said juxtaposed housing portions to position said rolls, and a counterbalancing piston and cylinder arrangement coupled to both of said plunger and cylinder arrangements for retracting said plungers in termination of said bearing engagement.

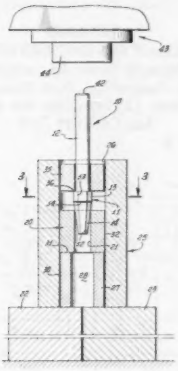
3,884,065
STRAIGHTENING ELONGATED ARTICLES
Gordon Howard Townend, Wolverhampton, England, assignor to GKN Group Services Ltd., Worcestershire, England
Filed Aug. 8, 1973, Ser. No. 386,799
Claims priority, application United Kingdom, Aug. 8, 1972, 36878/72
Int. Cl. B21d *11/14*
U.S. Cl. 72—299 **3 Claims**



1. A method of straightening an elongated article having a bent portion of substantially constant cross-section comprising the steps of clamping the article at each end so as to hold one end stationary while the other end is clamped so as to permit the end to be twisted about the longitudinal axis of the article, bringing a die into engagement with said portion of the article so as to constrain said portion of the article to take up a straight configuration without preventing twisting thereof about said axis, and twisting said other end of the article about said axis while said portion is so constrained to plastically strain sufficient of the material of said portion in torsion whereby when said portion is released from constraint said portion retains its straight configuration.

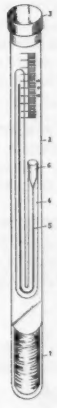
3,884,066
INTERNAL EXTRUSION DEVICE AND METHOD OF INTERNAL FORMING
LD Willmon, 226 36-A Nadine Cir., Torrance, Calif. 90505
Filed Jan. 30, 1974, Ser. No. 437,799
Int. Cl. B21k *21/16*
U.S. Cl. 72—343 **5 Claims**

1. An extrusion mandrel assembly for converting in a single operation a bore of circular cross section of a workpiece into a bore of non-circular cross section uniform throughout its length comprising a mandrel element embodying a forming section of the cross sectional configuration and dimensions of the finished non-circular cross sectional bore, a tapered entry section extending from the forming section, and a shank extending from the forming section in the direction opposite the entry section, and of a diameter no greater than the minimum diameter of the forming section, a support sleeve for said workpiece underlying said workpiece and of an exterior cross sectional dimension generally complementary with the exterior cross sectional dimension of said workpiece, guide means independent of and overlying said mandrel element centering the shank of the mandrel element within the circular cross sectional bore of said workpiece, said assembly further including a cylindrical hobbing pot circumferentially confining the support sleeve, workpiece and guide means, separable blocks supporting the hobbing pot and support sleeve, and power



means for advancing the mandrel element to extrude said non-circular cross sectional bore.

3,884,067
TENSIOMETER
Yaacov Mottes, 35B Dizengoff Str., Natanya, Israel
Filed June 19, 1972, Ser. No. 264,370
Claims priority, application Israel, June 23, 1971, 37125
Int. Cl. G01h *33/24*
U.S. Cl. 73—73 **1 Claim**



1. An improved soil moisture tensiometer comprising a tubular housing having a porous cup attached to the bottom thereof and a U-shaped narrow tube mercury barometer disposed within said housing, wherein the housing is provided with a removable closure for the upper end thereof and is adapted to be filled with water and closed by said closure and the barometer has a shorter leg open to the interior of said housing and a longer leg associated with a calibrated scale and sealed at its top, which leg is characterized by the existence of a vacuum between said sealed end and the mercury contained therein; said tensiometer further comprising means enabling said barometer and calibrated scale to be in moveable relationship to each other, whereby said barometer is adapted to indicate the moisture content of the soil surrounding said cup

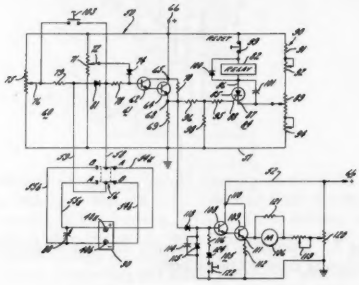
after said barometer and said scale have been adjusted relative to each other in accordance with the atmospheric conditions prevelant at the location at which the tensiometer reading is to be effected.

3,884,068

LOAD SENSING DEVICE

Frank R. Dybel, Olympia Fields, Ill., assignor to International Measurement & Control Co., Park Forest South, Ill.

Filed Mar. 12, 1974, Ser. No. 450,443
Int. Cl. G01b *7/16*
U.S. Cl. 73—88.5 R **9 Claims**



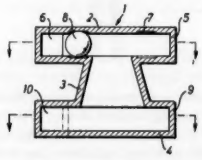
1. An improved sensing device for monitoring stresses which are intermittently applied to and removed from a deformable body, comprising, a transducer fixed to said body and having a pair of output terminals, said transducer being adapted to produce electrical output signals upon compressive loading and unloading of said transducer, said output signals being proportional to the change in loading on said transducer and having a polarity during compressive loading that is opposite that during unloading, detector means having a pair of input leads for connection with said transducer output terminals, and switch means for selectively reversing the connection between said input leads and tranducer terminals.

3,884,069

TRANSDUCER FOR A FLOW GAUGE

Per Ingemar Arnold Lind, Sollentuna, Sweden, assignor to Svenska Utvecklings AB (SUAB), Swedish National Development Co., Sweden

Filed Apr. 17, 1973, Ser. No. 351,826
Claims priority, application Sweden, Apr. 21, 1972, 5321/72; Apr. 21, 1972, 5322/72
Int. Cl. G01f *1/02, 1/06*
U.S. Cl. 73—194 C **28 Claims**



1. Transducer for a flow gauge comprising a housing, said housing comprising an inlet part having a central axis, all means connected to said inlet part spaced radially outwardly from the central axis for introducing fluid tangentially into said inlet part so that a swirling action is commenced therein, said inlet part arranged to maintain the swirling action of the fluid introduced through said wall means, an outlet part in fluid communication with said inlet part, said outlet part having a central axis disposed in axial alignment with the central axis of said inlet part, said outlet part arranged to maintain the swirling action of the fluid commenced and maintained in said inlet part, a rotary body positioned in said housing in the path of the swirling movement of the fluid and arranged so that its rotation represents the flow volume through said housing, said wall means forming a closed inlet channel into said inlet part, characterized in that the distance R_i from the center line of said inlet channel to the axis of said outlet part is defined by the formula:

$$0.75(w/2 + 2r_b + r_d) < R_i < 1.25(w/2 + 2r_b + r_d)$$

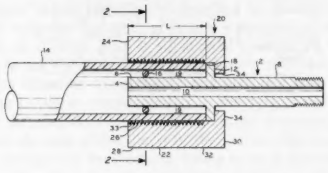
where w is the width of said inlet channel, r_d is the smallest radius of said outlet part, and r_b is the radius of said rotary body when said rotary body is in the form of a ball.

3,884,070

APPARATUS FOR TESTING CONDUIT

Tom J. Windle, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 133,166, April 12, 1971, Pat. No. 3,709,260. This application Sept. 11, 1972, Ser. No. 287,737
Int. Cl. G01m *3/02*
U.S. Cl. 73—49.8 **3 Claims**



1. An apparatus for passing fluid into a plastic conduit for pressure testing said conduit, comprising:

a mandrel having a first end, first and second end portions, a chamber extending therethrough, and an annular flange of at least greater diameter than the inside diameter of the conduit and being spaced a distance along the mandrel from said first end, said first end portion extending from the flange to the first end of the mandrel being of smaller diameter than the inside diameter of the conduit and having at least one resilient annular member having an outer diameter substantially equal to the inside diameter of the conduit for insertion of the first end portion and associated annular member into the conduit with said annular flange in contact with said conduit; and

a removable clamp having separate, opposed first and second portions with each portion having an inner surface with first and second end portions and a middle portion, said first end portion of the inner surface of each clamp portion being of an arcuate configuration in the range of greater than 120° to less than 180° and having a length at least greater than the distance from the resilient annular member to the flange of the mandrel, said middle portion of each clamp portion being of a length at least equal to the width of the flange of the mandrel and said second end portion of each clamp portion having an inwardly extending flange of dimensions sufficient for extending over the flange of the mandrel in the installed position thereof, said first and second clamp portions being pivotally attached and pivotally movable between a first position at which the inner surfaces of the clamp portion are spaced from the conduit and the mandrel for inserting into and removing the mandrel from the conduit and a second position at which the first end portions of the clamp portions are in contact with the conduit and forcefully urging said conduit against the resilient annular member of the mandrel positioned therein with the flange of the clamp extending over and contacting the flange of the mandrel for maintaining the first end portion of the mandrel within the conduit during passage of fluid

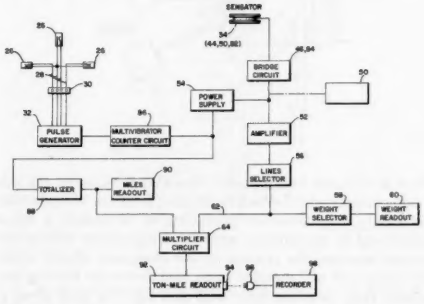
through the mandrel and into the conduit for pressure testing said conduit.

3,884,071

ELECTRONIC TON-MILE INDICATOR

Calvin Richard Howeth, Cleveland, and Frank Angelo Dickey, Oklahoma City, both of Okla., assignors to Calvin Richard Howeth, Moore, Okla.

Filed Dec. 11, 1973, Ser. No. 423,703
Int. Cl. E21b *47/00*
U.S. Cl. 73—151 **21 Claims**



1. An electronic ton-mile indicator in an oil well drilling rig or the like for sensing and indicating work done by the line in the rig, comprising; electronic distance measuring means for producing an output signal pulse for a predetermined linear increment of movement of the line past a given point, said electronic distance measuring means comprising rotatable switch actuation means responsive to movement of said line and stationary switch means located adjacent to and periodically closed by rotation of said switch actuation means for producing said output signal pulse upon closing of said switch means, said rotatable switch actuation means comprising a pair of magnets spaced apart 180° on a sheave in said oil well drilling rig or the like producing an interpretable output signal in response to a load applied to the line; and multiplier circuit means for receiving distance measuring output signal pulses and load responsive interpretable output signals and for multiplying said signals to produce an intelligible readout indicating ton-miles of work performed by the line.

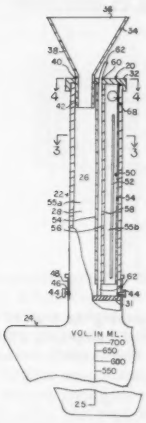
3,884,072

FLOW MEASURING APPARATUS HAVING A COLORIMETRIC URINE INDICATOR

Shu-Sing Cheng, Hanover Park, Ill., assignor to The Kendall Company, Walpole, Mass.

Filed May 14, 1973, Ser. No. 360,235
Int. Cl. G01f *1/00*; G01n *33/16*
U.S. Cl. 73—215 **8 Claims**

1. A device for measuring the approximate peak flow rate of a urine discharge, comprising: a receptacle having a cavity and an inlet port adjacent an upper end of the receptacle for passage of the urine discharge into the cavity, and a weir having opening means for passage of urine from the cavity through the opening means, said device including an indicating strip for measuring the approximate maximum height of urine collected in said cavity, said strip comprising an absorbent carrier bearing an indicating chemical which undergoes



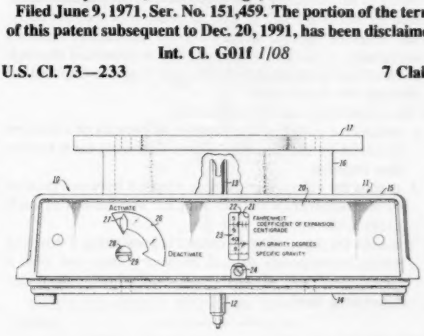
an irreversible color change upon exposure to the chloride ions present in urine.

3,884,073

DEACTIVATOR MECHANISM FOR AUTOMATIC TEMPERATURE COMPENSATOR

Howard E. Siebold, Libertyville, Ill., assignor to Liquid Controls Corporation, North Chicago, Ill.

Filed June 9, 1971, Ser. No. 151,459. The portion of the term of this patent subsequent to Dec. 20, 1991, has been disclaimed.
Int. Cl. G01f *1/08*
U.S. Cl. 73—233 **7 Claims**



1. An automatic temperature compensator comprising
a meter,
a counter,
an input shaft adapted to be driven by said meter,
an output shaft adapted to drive said counter,
compensating means driven by said input shaft and responsive to the temperature of the product being metered for driving said output shaft, and
deactivating means for disconnecting said compensating means from said output shaft and connecting said input shaft directly to said output shaft while said compensating means remains connected to said input shaft.

3,884,074

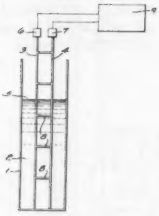
SONIC LIQUID LEVEL MEASURING APPARATUS

Hans R. Robertsson, Molndal, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed May 8, 1974, Ser. No. 468,164

Int. Cl. G01f *23/38*

U.S. Cl. 73—290 V 12 Claims



1. Apparatus for measuring the level of the top surface of liquid in a tank, of the type comprising a first elongated vibration propagating body that extends downwardly in the tank from near its top, exciter means coupled to said body for recurrently imparting an excitation impulse to it that produces sonic vibration in it, at least one other elongated vibration propagating body extending down into the tank from near its top, detector means coupled to said other body for producing electrical signals in response to vibrations propagated through said other body from the exciter means and by way of the first body, and calculating means connected with said exciter means and said detector means for calculating liquid level in the tank as a function of time required for propagation of vibrations from the exciter means to the detector means, said apparatus being characterized by:

A. a plurality of elongated bridging members extending transversely to said bodies and each connected to both of said bodies, said bridging members being fixed to said bodies at lengthwise spaced intervals along them and being of substantially rigid material that propagates vibration so that as a result of each excitation of the first body, the detector means, during a time thereafter, receives successive periods of vibration, one transmitted through each of said bridging members and a final one transmitted through the liquid; and

B. the calculating means comprising

1. means for counting the number of periods of vibration received by the detector means following each excitation impulse,
2. means for recording the time elapsed between receipt by the receiver of the last and the second-last of such periods of vibration, and
3. means for presenting an output representing a distance which corresponds to said number minus one plus a function of said elapsed time, and which output denotes said level.

3,884,075

APPARATUS FOR MEASURING SURFACE TEMPERATURES OF THIN ELONGATED OBJECTS BY INFRARED RADIATION THEREFROM

Gerold Brandli, Windisch, and Pierre Keller, Baden, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

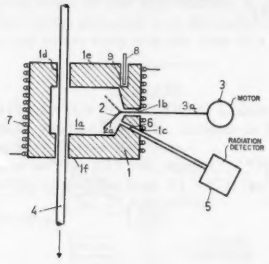
Filed Mar. 11, 1974, Ser. No. 450,045

Claims priority, application Switzerland, Apr. 30, 1973, 6095/73

Int. Cl. G01j *5/54, 5/62;* G01k *13/06*

U.S. Cl. 73—355 EM 3 Claims

1. Apparatus for measuring the temperature at the surface of a relatively thin elongated object by measurement of the infrared radiation emitted from the surface thereof which comprises a compensating radiator constituted by a thermally conductive metallic body having a cavity therein, said metallic body including a bore therein communicating with said cavity and through which the elongated object is inserted into said cavity, a rotatable chopper wheel mounted for rotation within said cavity, an infrared radiation detector positioned to receive in alternation the infrared radiation emitted from the surface of the elongated object within said cavity and which passes intermittently through said rotating chopper wheel and infrared radiation emitted from the wall of said cavity and



which is reflected intermittently into said detector by the side of said chopper wheel which faces away from the object within said cavity, said detector producing at its output a signal determined in accordance with the temperature differential existing between the portion of the elongated object within said cavity and said metallic body, and means for heating said metallic body in accordance with said signal in such sense as to reduce said signal to zero whereby the temperature of said metallic body then equals the temperature of the elongated object.

3,884,076

MEASURING DEVICE

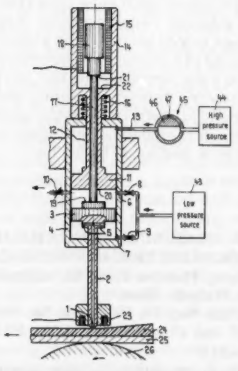
Urs Peter Studer, Orpund, Switzerland, assignor to Zumbach Electronic-Automatic, Orpund, Switzerland

Filed Dec. 4, 1972, Ser. No. 312,047

Claims priority, application Switzerland, Dec. 7, 1971, 17780/71

Int. Cl. G01b *13/04*

U.S. Cl. 73—37.6 8 Claims



1. A measuring device incorporating a measuring nozzle through which a pressure medium is conveyed against the surface of an object to be measured, and another non-pneumatic measuring feeler displaceable together with said nozzle, said nozzle and measuring feeler being kept at a predetermined distance from the surface of the object to be mea-

sured by means of a control piston which is urged on the measurement nozzle side by the pressure medium feeding said nozzle and, on the opposite side by a reference pressure, wherein the control piston is located in a cylinder the length of which is such as to enable the control piston to transfer the measuring nozzle to a resting position and conversely, valve means being provided for control of the pressure condition within said cylinder and for thereby transferring the measuring device by the control piston.

3,884,077

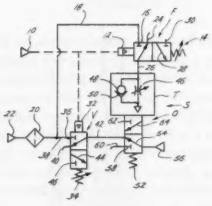
RATE OF PRESSURE CHANGE SENSING SYSTEM

Lawrence F. Athy, Jr., Houston, Tex., assignor to Southwestern Manufacturing Co., Houston, Tex.

Filed June 1, 1973, Ser. No. 366,098

Int. Cl. G01l 7/00

U.S. Cl. 73—388 R **9 Claims**



1. A system for sensing an abnormal change in pressure in a fluid handling system within a reference time interval, comprising:

a. means for establishing a first fixed pressure threshold level;

b. first sensor means for sensing a first change in the fluid pressure in the system with respect to the first fixed pressure threshold level;

c. means for establishing a second fluid pressure threshold level;

d. second sensor means for sensing a second change in the fluid pressure in the system with respect to the second fixed pressure threshold level;

e. timing means for establishing a reference time interval for occurrence of an abnormal pressure change in the form of said first change and said second change; and

f. output means for forming an output signal in response to occurrence of said first change and said second change within the reference time interval established by said timing means to thereby indicate the abnormal pressure change.

3,884,078

LOW-PRESSURE MEASURING TRANSFORMER

Rudolf Zeiringer, Graz, Austria, assignor to Hans List, Graz, Austria

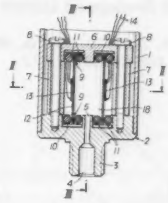
Filed June 15, 1973, Ser. No. 370,449

Claims priority, application Austria, June 16, 1972, 5221/72

Int. Cl. G01l 9/04

U.S. Cl. 73—398 AR **6 Claims**

1. A low-pressure measuring transformer, in particular for explosion-prevention devices, comprising a housing having an open extremity, a bottom portion terminating the housing at said open extremity and having a central through bore, an abutment arranged in the housing in spaced relation to said bottom portion, said bottom portion and said abutment being designed as rigidly interconnected plates having an annular groove on each of the front ends opposing each other, a flexible flat ring and two O-shaped rings each adjoining same being arranged in concentric relation to each other and being inserted in each of the annular grooves, an expansion joint designed as a thin-walled tube open at both ends extending from said bottom-portion as far as said abutment, each of the open tube ends protruding into one of the annular grooves of the bottom portion and of the abutments and clamped between the concentrically arranged O-shaped rings so as to form a flexible seal, at least two strain gauges located in opposite outer surfaces of said expansion joint, the expansion joint being impinged upon internally by the pressure to be measured through the bore of the bottom portion.



3,884,079

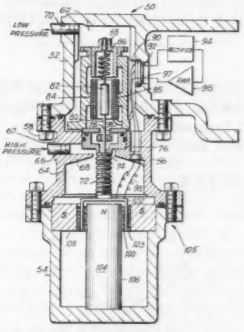
FORCE BALANCE DIFFERENTIAL PRESSURE TRANSMITTER

Quentin C. Turtle, Cranston; Pasco A. Coia, Providence, both of R.I., and John R. Silva, Rehoboth, Mass., assignors to General Signal Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 323,446, Jan. 15, 1973, abandoned. This application Nov. 5, 1973, Ser. No. 413,062

Int. Cl. G01l 9/10

U.S. Cl. 73—398 R **5 Claims**



1. A force-balance differential pressure transmitter, comprising:

a casing having first and second pressure chambers therein;

a pressure sensing device for measuring the difference in pressure between the two chambers, said device having an initial position;

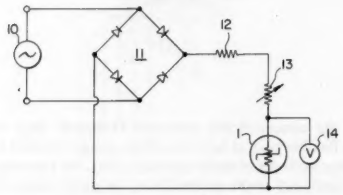
a linear variable differential transformer including a core movable in response to movement of said pressure sensing device;

feedback means, including a feedback coil for receiving current derived from said transformer, said coil being operable to restore said pressure sensing device substantially to its initial position;

a common direct current power supply and a two-wire transmission line or loop connected to said power supply, including means for both transmitting signal current over the transmission line to a central station and for deriving

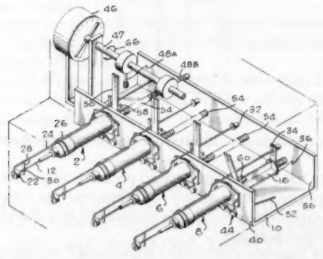
bi-polar voltages serving as local power supplies at the location for said differential pressure transmitter.

3,884,080
VACUUM GAGE
Ronald Chapman, Orleans, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada
Filed Sept. 24, 1973, Ser. No. 400,567
Int. Cl. G01l *21/12*
U.S. Cl. 73—399 **9 Claims**



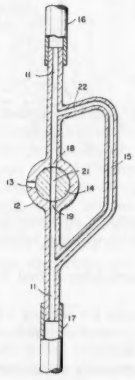
1. A vacuum gage comprising:
a sensing element having a thin film of polyconductor material of predetermined transition temperature between low and high conductivity states, said film adapted to be exposed to the gas in the vacuum to be measured;
current means for providing a cyclically varying current through the thin film, to cyclically heat said film above said transition temperature so that the thin film will cyclically switch between its low conductivity state and its high conductivity state;
means for determining the average resistance of the thin film over at least a predetermined portion of the current cycle, said average resistance indicating the pressure of said gas due to heat transfer from said thin film to the gas.

3,884,081
AUTOMATED SEQUENTIAL AIR SAMPLER
George A. Griffith, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.
Filed June 24, 1974, Ser. No. 482,140
Int. Cl. G01n *1/24*
U.S. Cl. 73—421.5 R **37 Claims**



1. An air sampling device for obtaining a plurality of air samples at scheduled time intervals, said air sampling device comprising:
a plurality of piston pumps each having a housing forming an interior chamber, an inlet port member communicating with said chamber, and a plunger which is partially retracted from within said chamber of said housing to draw air into said chamber through said inlet port member when a said piston pump is actuated;
a plurality of sealer means respectively connected to a different one of said pumps for sealing off said inlet port member thereof in response to the plunger thereof being partially retracted from within the chamber thereof by a predetermined distance; and
actuator means for actuating each of said plurality of pumps at scheduled time intervals.

3,884,082
VACUUM DISTILLATION SAMPLING APPARATUS
Gregory C. Merciadis, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.
Filed Apr. 16, 1973, Ser. No. 351,216
Int. Cl. G01n *1/10*
U.S. Cl. 73—422 TC **2 Claims**

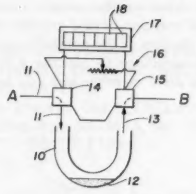


1. A sampling device for sampling liquid distillate during distillation comprising a fixed assembly designed to be fitted onto the off-take portion of a distillation apparatus from which samples are to be taken and having
a. a primary fluid passage fitted with
b. a sampling valve comprising a body portion having walls and a hollow interior, said walls containing an inlet port, an outlet port, and a sampling port, each extending from the exterior of said wall to the hollow interior thereof, said inlet and outlet ports being positioned on diametrically opposite sides of the walls and said sampling port being between said inlet and outlet ports, and including a rotatable valve member adjustably positioned within said hollow interior and provided with a flow channel therethrough, said flow channel having a diameter less than the distance between the inlet port and the sampling port and less than the distance between the sampling port and the outlet port, and said valve member being movable between a substantially vertical flow position wherein said channel connects said inlet and outlets ports so that fluid flowing through the primary fluid passage flows through said channel, and a substantially horizontal sampling position wherein said channel communicates with the discharge port and
c. a secondary fluid passage opening into the primary fluid passage at a point above and a point below said sampling valve and by-passing said sampling valve thereby permitting uninterrupted distillation while the sampling valve is in the sampling position.

3,884,083
SURFACE AREA DETERMINATION BY DIRECT READ-UT

Seymour Lowell, 42 Wood Hollow Rd., Albertson, N.Y. 11507

Continuation-in-part of Ser. No. 294,342, Oct. 2, 1972, abandoned. This application May 17, 1974, Ser. No. 470,733
Int. Cl. G01n *15/08*
U.S. Cl. 73—432 PS **2 Claims**



1. A method of determining the surface area of a solid material comprising the steps of forming a gaseous mixture of an adsorbate and a relatively nonadsorbable carrier gas in the ratio of 30 percent of the former to 70 percent of the latter, calibrating a digital counter having a digital display so as to display a selected numerical value for each unit volume of said adsorbate which corresponds to the surface area to which a monolayer of said adsorbate will adsorb at specified conditions of pressure and temperature, establishing pressure conditions to produce a continuous flow at a selected rate of flow of said gaseous mixture to measuring means controlling the display of said digital counter, flowing and continuously flowing gas mixture prior to encountering said measuring means over the surface of a sample of solid material at a selected reduced temperature at which adsorption of the adsorbate takes place to thereby cause adsorption of said adsorbate to said surface, while maintaining said continuous flow at said selected flow rate of said gaseous mixture raising the temperature of said sample of solid material to cause desorption of said adsorbate from said surface into said continuously flowing gaseous mixture to provide an additional volume of adsorbate for intermixture therewith, directing said gaseous mixture with said additional volume through a flow chamber of a correspondingly increased volume so. that said previously noted selected rate of flow is substantially maintained therein by virtue of said increased volume flowing at a slower rate through said flow chamber, and causing the measurement of said continuously flowing gaseoud mixture with said additional volume of said adsorbate by operating said calibrated digital counter therewith and having said digital display of said digital counter display multiples of said selected numerical value for each unit volume of said adsorbate.

3,884,084
METHOD FOR DETERMINATION OF OIL COATING WEIGHTS ON NON-OIL ABSORBING SURFACES

Ralph M. Raybeck, and Charles R. Hines, both of Pittsburgh, Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed June 20, 1974, Ser. No. 481,097
Int. Cl. G01n *33/28*
U.S. Cl. 73—432 R **11 Claims**

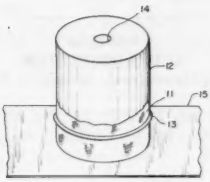
1. A method for determining the weight of oil coatings on a non-oil absorbing material surface, comprising:

a. placing a permeable material covered end of a substantially circular hollow container in contact with an oil coated surface which is composed of a non-oil absorbing material;

b. adding an oil solvent into the interior of said hollow container in a manner which causes said solvent to pass through said permeable material and to dissolve oil contained on said oil coated surface;

c. permitting said solvent to evaporate so as to leave a substantially circular oil stain on said permeable material;

d. measuring physical characteristics of said oil stain which correlate with oil coating weight of said oil coated surface; and

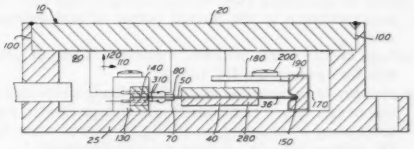


e. determining the weight of oil contained on said oil coated surface by comparing the measured oil stain physical characteristics with oil stain physical characteristics of oil coated surfaces of a known oil weight.

3,884,085
ACCELEROMETER ASSEMBLY

Paul Beckman, Huntington Valley; Benjamin F. Gerding, Chalfont, and Prabhat Kumar Jain, Norristown, all of Pa., assignors to Robinson-Halpern Company, Plymouth Meeting, Pa.

Filed Apr. 5, 1972, Ser. No. 241,318
Int. Cl.[2] G01D *15/12*
U.S. Cl. 73—517 R **22 Claims**



1. An accelerometer assembly for measuring acceleration forces in a predetermined direction adapted for use in a high temperature environment, comprising:

a. a housing defining an internal chamber;

b. a longitudinally extended ceramic beam within said chamber, said beam rigidly secured at one longitudinal end thereof to said chamber and partially constrained on the opposing longitudinal end thereof, said beam being movable in said predetermined direction responsive to said acceleration forces applied to said housing;

c. means for respectively rigidly securing and partially constraining said ceramic beam on opposing longitudinal ends thereof within said internal chamber of said housing, said securing means including:

1. Cantilever restraining means rigidly secured to a first end of said longitudinally extended ceramic beam, said cantilever restraining means including a frame member fastened to an internal wall of said housing, said ceramic beam being rigidly fastened to said frame member on said first end for maintaining said longitudinally extended beam in spaced relation to said internal wall to said housing; and,

2. Stop means for movably interfacing with a second end of said ceramic beam, said second end of said beam being longitudinally opposed to said beam first end, said stop means including a base frame member rigidly secured to an internal wall of said housing adjacent said second end of said beam, said base frame member having a recess formed within a wall facing said beam second end for insertion of said ceramic beam second end in said longitudinally extended direction, said stop means including a flexible cushion assembly secured to

and contiguous with said wall for resiliently contacting said ceramic beam when said ceramic beam moves in said predetermined direction; and

d. Elastic displacement measurement means rigidly secured to said ceramic beam for measuring said beam elastic displacement when said beam is movably actuated in said predetermined direction.

3,884,086

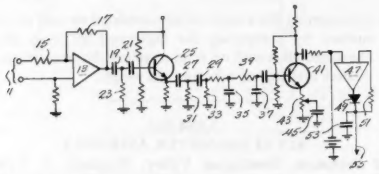
AUDIO DOSIMETER

James O. Steger, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Filed July 27, 1973, Ser. No. 383,292

Int. Cl. G01h *5/00*

U.S. Cl. 73—558 **3 Claims**



1. An audio dosimeter

means for sensing and converting sound to an electrical signal representing said sound,

weighted filter means for filtering said signal, said filter having a frequency response which approximates the human ear frequency response,

means for generating a DC voltage having a magnitude that is proportional to the filtered output of said weighted filter,

voltage divider means including a plurality of output terminals for dividing said DC voltage,

a plurality of comparator means each being connected to one of said output terminals of said voltage divider, each succeeding comparator generating an output when said DC voltage raises by a predetermined magnitude,

a source of clock pulses, a divider means having multiple outputs for providing sequentially decreasing discrete frequency outputs,

a plurality of gating means one each connected to an output of said divider, each being enabled by the output of an associated comparator to gate said pulses from said divider to said counter, and

means for reading out the count of said counter.

3,884,087

DRIVE ASSEMBLY FOR ROTARY HEAT REGENERATOR

Yoshihiro Sakaki, Yokohama, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Dec. 19, 1973, Ser. No. 426,019

Claims priority, application Japan, Dec. 21, 1972, 47-128414

Int. Cl. F16h *21/12*

U.S. Cl. 74—63 **3 Claims**

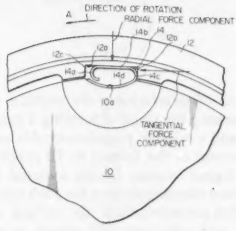
1. A rotary heat regenerator comprising:

a cylindrical heat accumulator having a plurality of recesses formed in its circumference equidistant from eahc other; an annular drive member having a plurality of recesses, corresponding in numbers to the recesses of said heat accumulator, said annular drive member being outwardly concentric with said cylindrical heat accumulator such that each of the recesses of said annular drive member being in substantial radial alignment with each of the recesses of said cylindrical heat accumulator to form adjacent pairs of recesses;

a plurality of plate springs, corresponding in numbers to said pairs of recesses, disposed in corresponding spaces, each defined by one of said pairs of recesses, each of said plate springs, in its free state having a generally parabolic profile with an end portion of of one of the legs of the parabolic curved inwardly toward the vertex;

said plurality of plate springs being disposed in the corresponding spaces and compressed therebetween and spacing said annular drive member radially apart from said heat accumulator;

each of said plate springs being disposed in the corresponding pairs of recesses such that the vertex of the parabolic profile abuts with an end face of each of said recess of said annular drive member which is oriented forward in a direction of rotation of said annular drive member and the other of the legs of the parabolic profile bears against said heat accumulator to provide a driving connection between said drive member and said heat accumulator;



said end portion of said one leg of the parabolic profile of each of said plate springs being radially spaced from the other leg of the parabolic profile and tangentially spaced from an opposite end face of each of said recesses of said drive member which is opposed to said end face and is oriented rearward in the direction of rotation of said drive member to permit deformations of said other leg and said leg of the parabolic profile to absorb a portion of a shock when said heat accumulator encounters temporary resistance to rotation upon being driven by said annular drive member; and

said end portion being constructed and arranged such that it deforms to absorb remaining portion of said shock.

3,884,088

TIMER HAVING TWO SEPARATE CAM MEANS AND MEANS ADVANCING THE CAM MEANS AT DIFFERENT SPEEDS

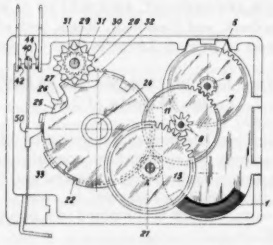
Marcello Bertozzi, and Mario Chioffi, both of Forsinone, Italy, assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Dec. 3, 1973, Ser. No. 420,887

Claims priority, application Italy, Jan. 23, 1973, 47857/73

Int. Cl. F16h *27/04*, *55/04*

U.S. Cl. 74—84 **6 Claims**



1. A timer comprising:

a. motor drive means

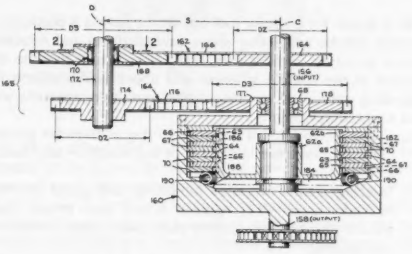
b. a first cam means
c. a first speed reduction gear system coupling said first cam means to said motor drive means,
d. a second cam means, and
e. a second speed reduction gear system coupling said second cam means to said first cam means,
f. each of said speed reduction gear systems including means providing a speed reduction greater than the ratio of the number of teeth of two gears of said gear systems.

3,884,089

MULTI-SPEED MOTION TRANSMITTING MECHANISM

Stellios Antony Avramidis, Greenfield, Ind., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 294,410, Oct. 2, 1972, Pat. No. 3,845,666.
This application Apr. 19, 1974, Ser. No. 462,284
Int. Cl. F16h *9/04*
U.S. Cl. 74—217 C **4 Claims**



1. A multi-speed motion transmitting mechanism comprising an input member and an output member mounted on a common axis, a centrifugal clutch having two rotatable members, one of said members connected to said output member for rotation therewith and the other of said members connected to said input member for rotation therewith, an auxiliary member spaced from said axis having an overrunning clutch thereon, means connecting said input member to said auxiliary member through said overrunning clutch, means connecting said auxiliary member to said one of said centrifugal clutch members to drive said output member through said overrunning clutch and said auxiliary member when the centrifugal clutch is disengaged, said centrifugal clutch operable to connect the output member directly to the input member for rotation at the same speed as the input member when said centrifugal clutch is engaged.

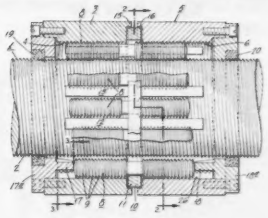
3,884,090

ROLLER SCREW MECHANISM

Lars Ingmar Dock, Lutry, Switzerland, assignor to SKF Industrial Trading and Development Company B.V., Jutphaas, Netherlands

Filed Apr. 19, 1973, Ser. No. 352,737
Int. Cl. F16h *1/18, 55/18*
U.S. Cl. 74—424.8 C **5 Claims**

1. Roller screw mechanism comprising a screw member having an external thread, a nut circumscribing the screw member having an internal thread, a plurality of rollers in the annular space between said members having a groove configuration adapted to interengage with threads on the nut and screw members, and a cage for guiding said rollers, said nut comprising at least one pair of members having means adjacent their confronting axial ends defining a circumferentially extending pocket and said cage consisting of an annular portion centrated in said pocket and a plurality of circumferentially spaced fingers projecting from said central annular portion axially in each direction to define a plurality of aperatures on either side of the central annular portion for the rollers, each of said rollers having a web portion and said central annular portion being provided with circumferentially spaced



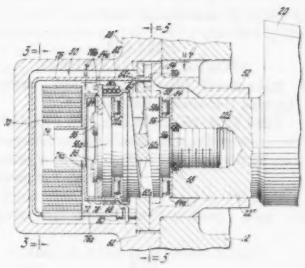
recesses at least partly enclosing the web portion of said rollers.

3,884,091

PITMAN SHAFT AXIAL SELF-ADJUSTING DEVICE

Charles N. Hay, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 12, 1974, Ser. No. 460,335
Int. Cl. B62d *1/20;* **F16h** *35/06*
U.S. Cl. 74—499 **7 Claims**

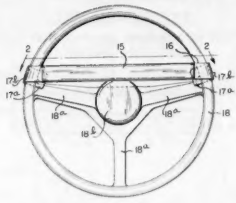


1. A self-adjuster for axial alignment of the pitman shaft rotatably journalled in the housing of a manual steering gear assembly, said self-adjuster including a shouldered shaft extension fixed to and extending from the inner end of the pitman shaft, said shaft extension having a radial flange adjacent to the free end thereof, a pair of annular cams rotatably supported on said shaft extension and fixed axially between said flange and the inner end of the pitman shaft, said cams each having spaced apart axial extending cam ramps thereon and being rotatively locked together to provide cam slots between said cam ramps, a support cam axially and non-rotatively fixed to the housing and having extension cams thereon extending into said cam slots whereby rotational movement of said cams relative to said extension cams of said support cam will vary the axial position of the pitman shaft, torsion spring means operatively fixed at one end of said support cam and operatively connected at its other end of said cams to normally rotatively bias said cams in an up-ramp axial take-up direction relative to said support cam, and a releasable locking means operatively connected to said cams to lock said cams against rotation by said torsion spring except during the centered steering position of the pitman shaft.

3,884,092
STEERING WHEEL ARM REST ATTACHMENT

Stanley E. Raudebaugh, 9937 N.W. 65th Ct., Tamarac, Fla. 33321

Filed Nov. 21, 1973, Ser. No. 418,083
Int. Cl. B62d 1/06
U.S. Cl. 74—558 4 Claims

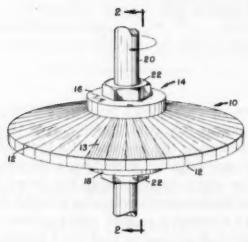


1. An armrest for use upon an automobile steering wheel having a rim, comprising a narrow cushion strip which is continuous and extends substantially the full width of said wheel at a zone near a diameter thereof, a stiffener member secured to the under side of said cushion strip and extending the entire width of said wheel at said zone, and means for detachably securing said stiffener member to the rim of said steering wheel including said stiffener member terminating in a deformable portion at each end, and each said deformable portion being bent to provide a hook there, said hooks so spaced and shaped as to hold said stiffener member wedged on said wheel at one side of said wheel diameter.

3,884,093
SPOKED DISC FLYWHEEL

David W. Rabenhorst, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Mar. 15, 1974, Ser. No. 451,415
Int. Cl. F16c 15/00
U.S. Cl. 74—572 10 Claims



1. An energy storage structure rotatable about an axis of rotation extending transversely therethrough, the structure comprising a plurality of anisotropic filamentary elements,

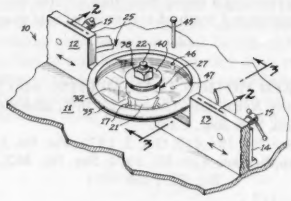
a multiplicity of the elements being bonded together into individual spoke-like members which are arranged into a disc-like configuration, inner ends of the members being thicker axially than the outer ends of the members and outer ends of the members being thicker peripherally than the inner ends of the members; and ,

hub means holding the spoke-like members, the members extending radially from the hub means about the periphery thereof.

3,884,094
ROTARY TOOL GUARD

Jamie F. Ulmer, Rt. 1, Hwy. 70, Mt. Juliet, Tenn.

Filed May 23, 1974, Ser. No. 472,835
Int. Cl. F16p 1/00
U.S. Cl. 74—609 11 Claims



1. A guard for a rotary tool apparatus having a platform, a vertical spindle projecting above said platform and rotatably driven about its vertical axis, and a rotary tool fixed to the portion of the spindle adjacent and above said platform for operating upon work upon said platform in engagement with said tool, comprising:

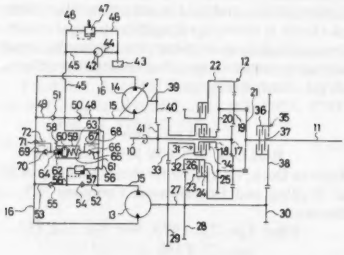
a. a disc-shaped guard member having a diameter greater than the maximum diameter of the swath of said rotary tool, and

b. bearing means rotatably mounting said guard member coaxially upon said spindle above said rotary tool, whereby said guard member may rotate independently of said spindle.

3,884,095
DAMPER MECHANISM FOR HYDROSTATIC TRANSMISSION

Takayuki Miyao; Hiroaki Maeda, both of Toyota, and Masanori Sato, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Toyota, Japan

Filed July 17, 1973, Ser. No. 379,947
Claims priority, application Japan, July 31, 1972, 47-76738
Int. Cl. F16h 47/04; F16l 55/04; F15b 13/16
U.S. Cl. 74—687 7 Claims

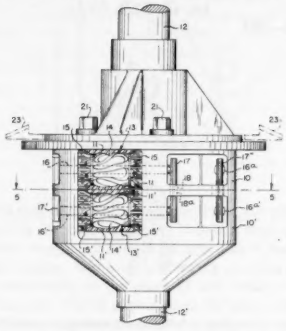


1. In a hydrostatic transmission comprising an input shaft, an output shaft, a differential gear set between said shafts, and two pump-motors hydraulically connected to each other by first and second hydraulic circuits, said pump-motors being adapted for selectively associating with said input shaft, said output shaft and said differential gear set to provide a plurality of speed range drives, the improvement comprising a damper mechanism arranged between said first and second hydraulic circuits for interrupting hydraulic communication therebetween and for absorbing any vibrations of hydraulic pressure when a sudden change of hydraulic pressure occurs in at least one of said first and second circuits.

3,884,096
FLOATING JOURNAL PIN IN MULTIPLE GEAR DIFFERENTIAL

Vernon E. Gleasman, 3808 Kirkwood Rd., Cleveland Heights, Ohio 44121

Filed July 18, 1972, Ser. No. 272,800
Int. Cl. F16h *1/38*
U.S. Cl. 74—715 5 Claims



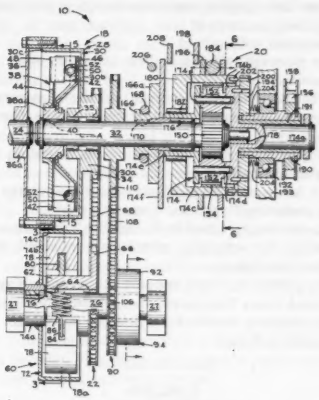
1. In a differential mechanism, a differential gear case adapted to be driven by a source of power, two substantially identical gear sets assembled in said case, a central worm traction gear in each gear set, a set of transfer gear complexes operatively associated with each of said traction gears, each complex comprising in longitudinal alignment a worm wheel with a reversible balancing gear at each end thereof rotatable with the associated worm wheel, each of said worm wheels in meshing engagement with its associated traction gear, each of said gear complexes having a through opening axially thereof, a shaft extending through each of said through openings and extending endwise therebeyond at each end, all of said shafts being the same length, said traction gears in axial alignment with each other and mounted for rotation in said case independently of the rotation of the case and of each other, said gear sets being assembled in said case with the transfer gear complexes of one gear set in registering pairs with the similar transfer gear complexes of the other gear set and with the said balancing gears in one gear set meshing with the balancing gears of the registering complex in the other gear set; the combination therewith of pin means in said case engaging at least one end of said shafts in each registering pair at the same ends of said shafts and permitting only slight endwise movement of said shafts in at least one direction.

3,884,097
TWO STAGE TRANSMISSION

Stellios Antony Avramidis, Greenfield, and John L. Craig, Mooresville, both of Ind., assignors to FMC Corporation, San Jose, Calif.

Filed Mar. 21, 1973, Ser. No. 343,329
Int. Cl. F16h *37/00*
U.S. Cl. 74—740 3 Claims

1. A transmission having an automatic stage and a manual stage, said transmission having a connecting shaft between the automatic stage and the manual stage, said automatic stage comprising an input shaft rotatable at varying speeds, a first centrifugal clutch mounted on said connecting shaft, an auxiliary shaft, a second centrifugal clutch and an overrunning clutch mounted on said auxiliary shaft, a first drive train connected between said first centrifugal clutch and said second centrifugal clutch, a second drive train connected between said overrunning clutch and said connecting shaft, said input shaft connected to said second centrifugal clutch through said first drive train to operate said second centrifugal clutch and drive said connecting shaft through said two driving trains and said auxiliary shaft after a predetermined speed of the input shaft is attained, said first centrifugal clutch operated after a predetermined speed of said connecting shaft is attained to drive said connecting shaft directly from said input shaft, and said manual stage consisting of an epicyclic train comprising a sun gear unit mounted on said connecting shaft, a ring gear

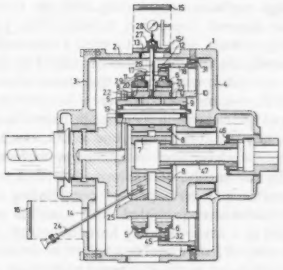


unit, and a planet gear unit between said sun gear unit and said ring gear unit for continuously meshing engagement therewith, an output shaft selectively connected to one or the other of the ring gear unit and the planet gear unit, and means manually to couple selected ones of said epicyclic gear units together to drive the output shaft at a selected speed ratio to the speed of said connecting shaft.

3,884,098
PLANETARY GEAR

August Gumpoltsberger, Sonthofen, Germany, assignor to BHS-Bayerische Berg Hutten-und Salzwerke Aktiengesellschaft, Munich, Germany

Filed Mar. 13, 1973, Ser. No. 340,850
Claims priority, application Germany, Mar. 20, 1972, 2213487
Int. Cl. F16h *1/28, 3/44, 57/02*
U.S. Cl. 74—801 2 Claims



1. In an improved planetary gear, particularly for use on boats comprising

A. an outer solar wheel having two parts,

B. an inner solar wheel, the solar wheels arranged in a housing,

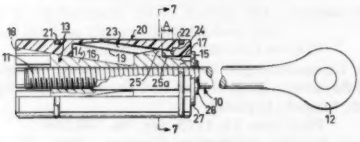
C. planetary wheels and support means therefor,

D. inner and outer coupling sleeves at the planetary wheels,
E. the improvement comprising access openings in
1. the housing
2. the wheels support means,
3. the coupling sleeves
said openings extending to the outer solar wheel, the planetary wheels, and the inner solar wheels,
F. means for engaging assembly members said last means comprising recesses at
1. the outer solar wheel
2. the planetary wheels, and the planetary wheel support means
the recesses at the solar wheels and the planetary wheels comprising circumferential grooves at the frontal surfaces, and
G. each planetary wheel support means including a hollow planetary wheel bolt,
said bolt being adapted to slidably receive a tubular support for a mounting flange for a traction device,
1. the planetary wheel bolt including first thread bores therein for engaging members connected with the mounting flange,
2. the planetary wheel support means including second thread bores therein outward of the wheel bolt bores for securing hydraulic cylinders supported by the mounting flange.

3,884,099
EXPANSION BOLT

Karl Birger Sikström, Lilla Gransgatan 2, S-971 00 Malmberget, Sweden

Filed Apr. 11, 1973, Ser. No. 349,925
Claims priority, application Sweden, Apr. 13, 1972, 4767/72
Int. Cl. F16b *13/06*
U.S. Cl. 85—75 **3 Claims**

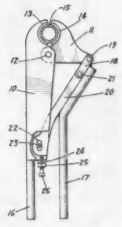


1. An expansion bolt comprising a threaded claimping screw, a tapered expansion member having a tapped bore threadedly engaging the screw and having at least one outer wedge surface and a number of clamping jaws having each of its inner wedge surfaces cooperating with an outer wedge surface of the tapered expansion member, the jaws being retained in engagement with the tapered expansion member by means of an elastic member and in abutment at one of their ends with an axial stop member on the screw when the jaws are held against rotation and the screw is rotated for axial displacement of the expansion member in a direction towards the axial stop member at the same time as the jaws by cooperation between the outer and inner wedge surfaces will be moved radially outwardly, characterized in that one of the wedge surfaces of at least a pair of cooperating outer and inner wedge surfaces is provided with a radial projection which is guided in a corresponding longitudinal groove in the outer wedge surface, that the projection is formed with a substantially radial end surface adapted to form an abutment surface, and that the groove has a corresponding abutment surface at one of its ends, there being provided a predetermined free axial space or distance between said abutment surfaces when the tapered expansion member has been screwed relative to the claimping screw so far that the conical member abuts the axial stop member on the screw and prevented from further screwing relative to the expansion member, whereby subsequent simultaneous axial movement of the screw and the expansion member relative to the jaws until the abutment surfaces engage one another expands the jaws still further.

3,884,100
PIPE TONGS

William C. Fideldy, Rt. No. 1, Bovey, Minn. 55709

Filed July 12, 1973, Ser. No. 378,685
Int. Cl. B25b *7/12*
U.S. Cl. 81—367 **2 Claims**



1. A pipe clamping device comprising a pair of jaw members, each of said jaw members having a concavely curved pipe engaging face,
handle means for opening and closing said jaw members for enclosing and gripping a pipe of predetermined diameter therebetween,
each of said faces having a transverse opening formed therein and extending completely through its respective jaw member,
an adaptor for each of said faces,
each of said adaptors being arcuate in cross section and having inner and outer walls of corresponding curvature, both of said walls having a curvature corresponding to the curvature of the faces of said jaw members,
the inner wall being adapted to engage the face of its respective jaw member, the outer face being adapted to engage and hold a pipe having a diameter smaller than said predetermined diameter,
each adaptor having a mounting pin integrally formed therewith and extending transversely from the inner wall, said mounting pin being insertable in said opening of said jaw member and extendable completely through said jaw member so as to extend outwardly from said jaw member, a portion of said mounting pin which extends outwardly from said jaw member being adapted to be engaged by a retaining element,
and a retaining element engageable with said portion of said mounting pin for removably holding said adaptor on said jaw member,
each of said adaptors being interchangeably mountable on either of said jaw members.

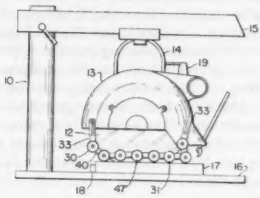
3,884,101
RADIAL ARM SAW GUARD

Howard Silkin, c/o Home & Industry Tool Distributors, Inc., 2867 Long Beach Rd., Oceanside, N.Y. 11572

Filed Aug. 19, 1974, Ser. No. 498,528
Int. Cl. B27b *5/28;* **B27g** *19/04*
U.S. Cl. 83—544 **3 Claims**

1. A guard for use with a radial arm saw having a motor, a blade driven by and mounted on said motor, and a housing mounted on said motor from which said blade projects downward, said housing having a front and a back and a motor side and an outer side, said guard comprising, in combination, endmost links each containing an elongated longitudinal slot at one end and an aperture at the other end, fastening means projecting from the front and back of said housing on the motor and the outer side, each of said fastening means slidably

extending through the longitudinal slot of one of said endmost links slidably securing said endmost links to said housing, intermediate links each containing longitudinal slots at the ends thereof and each having a center containing a lateral offset equal to the thickness of said intermediate links, plastic disks having a diameter at least fifty per cent greater than the



vertical thickness of said intermediate links, and pins connecting at least five intermediate links between each pair of said endmost links forming a length of articulated links on each side of said housing, said lengths hanging on each side of said blade and articulating in the plane of said blade, each of said pins mounting one of said plastic disks thereon on the sides of the lengths disposed away from said blade.

3,884,102

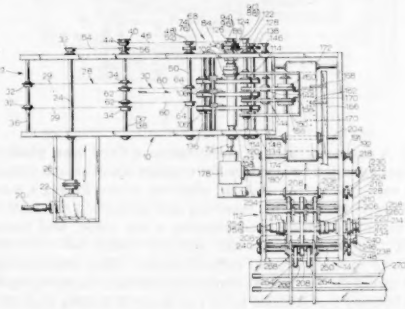
THREE KNIFE TRIMMING MACHINE

Hans G. Faltin, York, Pa., assignor to Advance Enterprises, Inc., York, Pa.

Filed Jan. 9, 1974, Ser. No. 432,033

Int. Cl. B26d *11/00*

U.S. Cl. 83—155 **9 Claims**



1. A machine for trimming the top and bottom sides and the side opposite the folded side of multi-sheet folded paper booklets at high speeds comprising in combination, a frame, feed conveyor means supported by said frame and having an inlet end adapted to be mounted adjacent the delivery end of a printing press upon which said booklets are printed and discharged therefrom in folded condition at a predetermined high press speed in a first direction, a first trimming unit on said frame adjacent the delivery end of said feed conveyor and having circular knife means provided with a toothed periphery coacting with a circular rotary anvil and adapted to edge-trim said booklets, means to drive said trimming unit, stop means positioned to be engaged by partially trimmed booklets discharged from said first trimming unit to stop movement thereof in said first direction, transfer conveyor means on said frame operable in a second direction transverse to said first direction of said feed conveyor and having one edge thereof aligned longitudinally in parallelism with said stop means, a second trimming unit on said frame aligned with said transfer conveyor to receive said partially trimmed booklets therefrom and trim the same sequentially and having knife and circular anvil means similar to those on said first trimming unit, means to drive said second trimming unit, discharge means for fully trimmed booklets adjacent the exit end of said second trimming unit, one of said trimming units having a single knife means and anvil to trim one side of booklets and the other trimming unit having a pair of cooperating knife means and anvils axially spaced to trim simultaneously the top and bottom sides of said booklets, said feed conveyor means and transfer conveyor means each comprising first and second sections respectively in longitudinally alignment with each other, means to drive the first section of each of said conveyors considered in the direction of movement of booklets thereby at a slower surface speed than the speed of the booklets as delivered thereto and thereby cause said booklets to become arranged in shingle fashion upon said first sections, and means to drive the second section of each of said conveyors at a speed substantially as high as press speed, thereby to space the successive leading booklets from the shingle arrangement thereof for delivery thereof respectively from said feed conveyor means to said first trimming unit and from said transfer conveyor means to said second trimming unit, at least the upper surface of the receiving end of said first section of said transfer conveyor means being at a lower level than the level at which partially trimmed booklets are discharged from said first trimming unit to facilitate positioning of the partially trimmed booklets in shingle arrangement upon the first section of said transfer conveyor means.

3,884,103

PAPER FEEDING DEVICE FOR A DUPLICATING MACHINE

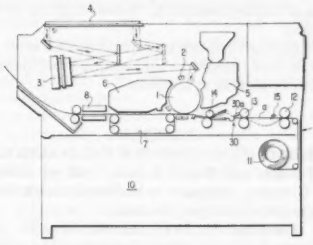
Yoshiharu Namba, Webster, N.Y., assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1973, Ser. No. 403,885

Claims priority, application Japan, Oct. 5, 1972, 47-99417

Int. Cl. B26d *5/20*

U.S. Cl. 83—156 **3 Claims**



3. A paper feeding device for use in a duplicating machine or the like, said feeding device comprising

first feed rollers for feeding a continuous roll of copy paper;

second feed rollers for receiving said copy paper from said first rollers;

means for intermittently increasing the speed of said first feed rollers with respect to said second feed rollers to form a first loop of said copy paper therebetween to lessen slippage between said second feed follers and said copy paper;

means for delivering a predetermined length of copy paper from said second feed rollers;

third feed rollers for receiving the copy paper from the second feed rollers, said third feed rollers continuously rotating at a speed less than that of said second feed rollers to form a second loop of said copy paper between said second and third roller pairs;

cutting means disposed between said second and third feed rollers for cutting said copy paper to said predetermined length; and

means for stopping said second roller pair after said predetermined length of copy paper has been delivered thereby and for actuating said cutting means to cut said predetermined length of copy paper before the third roller pair removes said second loop so that said second loop absorbs the impact of said cutting means on the copy paper to thereby lessen the affect of the cutting step on the operation of the duplicating machine or the like.

3,884,104

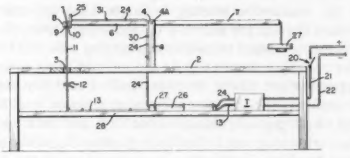
APPARATUS FOR PRODUCING PATTERNED OBJECTS OUT OF PLASTIC MATERIAL

Alva G. Carman, 4907 River Rd. North, Salem, Oreg. 97303

Filed Oct. 23, 1973, Ser. No. 408,631

Int. Cl. B26f *3/12*

U.S. Cl. 83—171 **2 Claims**



1. Apparatus for producing patterned objects out of plastic material, comprising in combination,

a horizontal work surface having an opening therethrough,

a beam superimposed upon said work surface rockably mounted relative thereto and divided into a lever arm and a load arm,

a cutting element extending upwardly through said opening in said work surface and attached at its upper end to the beam end constituting the end of the load arm,

electrical conductors extending from a source of controlled electrical current and connected one each to the top and bottom ends of said cutting element to selectively energize said cutting element to various degrees of temperature, and

whereby gravitational forces applied to said lever arm will transmit lifting forces to said load arm to maintain said element in tension at all times.

3,884,105

HIGH-DUTY CHEESE-SLICING MACHINE

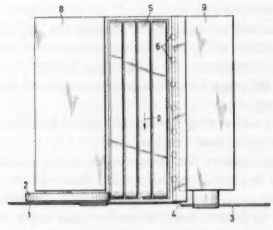
Andreas Fessler, and Ewald Fessler, both of Heimenkirch, Allgau, Germany, assignors to Hochland, Reich, Summer & Co., Heimenkirch, Allgau, Germany

Filed Oct. 18, 1973, Ser. No. 407,671

Claims priority, application Germany, Oct. 20, 1972, 2251567

Int. Cl. B23d *19/100*

U.S. Cl. 83—419 **6 Claims**



1. A cheese-slicing machine comprising first and second housing portions defining a gap therebetween, means for supporting a block of cheese and feeding it at an inclination to the horizontal through said gap, an eccentric rotatably mounted on said first housing portion, a circular slicing knife rotatably mounted on said eccentric in a cutting plane normal to the feeding direction of said block of cheese and adapted to be rotated at a faster speed than the rotary speed of said eccentric, said knife being reciprocated across said gap by the rotation of said eccentric so that said knife is alternately projected into and retracted from the feeding path of said block of cheese, and an abutment disc for said block of cheese mounted on said second housing portion opposite said knife and adapted to be reciprocated across said gap with a motion complementary to the reciprocating motion of said knife whereby the block of cheese abuts against an abutment face of said abutment disc when said blade is retracted, said abutment face of said abutment disc being spaced downstream of said cutting plane by a distance equal to the desired thickness of each cheese slice.

3,884,106

ADJUSTABLE SAW

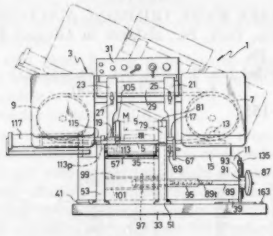
Tsuneo Aizawa, Isehara, Japan, assignor to Amada Company, Ltd., Isehara, Japan

Filed Nov. 30, 1973, Ser. No. 420,438

Claims priority, application Japan, Oct. 9, 1973, 48-112864

Int. Cl. B23d *55/02, 55/04*

U.S. Cl. 83—453 **8 Claims**



1. A saw comprising in combination: a fixed base; platform means mounted on said base for rotation about an axis extending vertically therefrom, said platform means having a material support surface for receiving and supporting the material to be cut; a cutting head carrying a saw blade, said cutting head being mounted on said platform means for movement relative to said material support surface when performing a cut through material positioned thereon; and clamping means for holding the material to be cut during a cutting operation, said clamping means including first jaw means having an elongated clamping surface fixed relative to said base, and second jaw means pivotally carried by said platform means and movable relative to said first jaw means to releasably hold the said material against said first jaw means during a cutting operation; the said axis being arranged coaxially with the line of intersection between said elongated clamping surface and the cutting plane of said saw blade.

3,884,107

PRESS PROVIDED WITH A PRESS-PLATE WITH THREE DEGREES OF FREEDOM

Vittorio Luigi Achille Bianchi, 37, Ave. Paul Doumer, 75016 Paris, France

Filed Mar. 21, 1973, Ser. No. 343,247

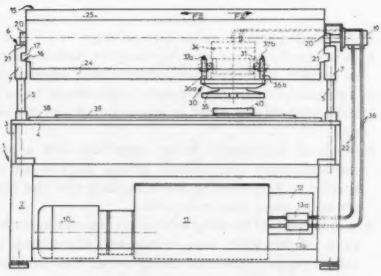
Claims priority, application France, June 30, 1972, 72.23815

Int. Cl. B26d *5/12*

U.S. Cl. 83—534 **7 Claims**

1. Press for cutting a material in the form of a sheet or web, comprising a base structure, a stationary horizontal work-

table fixedly supported by said base structure adapted to receive a material to be cut as well as a cutting tool placed on said material, said work-table having a predetermined length between opposed lateral ends thereof and a predetermined width extending forwardly and rearwardly between front and rear edges of said table, stationary longitudinal beams extending forwardly and rearwardly and arranged horizontally, in parallel relationship to one another, on either side of said work-table and above the latter over said lateral ends of said work-table at a distance from each other substantially equal to the length of said work-table, said longitudinal beams having front ends respectively situated substantially over said front edge of said work-table and extending from said front ends rearwardly beyond the rear edge of said table where said beams terminate in rear ends situated at an elevation higher than said table at a substantial distance to the rear thereof, a moving bridge extending substantially over the whole length of said work-table and having front and rear edges parallel to the front and rear edges of said work-table and situated from each other by a given distance, said beams extending rearwardly beyond said rear edge of said work-table by a distance which is at least substantially as great as the distance between said front and rear edges of said bridge, said bridge being supported at its ends by said longitudinal beams by means of a system of guide-ways and counter-guides so that said bridge



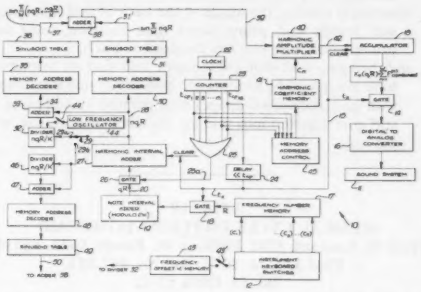
is capable of sliding horizontally along said beams across said table forwardly and rearwardly so as to either overhang said table to a predetermined extent or be situated substantially entirely to the rear of said table to provide unobstructed access thereto, a carriage mounted on said bridge at a lower portion thereof and movable in horizontal translation along said bridge toward one or the other of said beams in a direction perpendicular to the directions of displacement of the bridge itself so as to have two degrees of freedom over the work-table in a horizontal plane, namely freedom of movement forwardly and rearwardly and freedom of movement in opposed lateral directions, a press-plate supported by said carriage, said press-plate being movable in vertical translation with respect to said carriage so as to apply a vertical pressure on the cutting tool and cause it to penetrate into the material to be cut, when said press-plate is situated over the cutting tool, said press-plate having from front to rear a dimension substantially smaller than the distance between the front and rear edges of the table and from side to side a dimension substantially smaller than the length of said table, and said beams cooperating with said bridge for situating said press-plate in the region of the front and rear edges of said work-table or at any location between the latter front and rear edges while said carriage cooperates with said bridge for situating said press-plate at the region of the lateral ends of said work-table or at any location between said lateral ends.

3,884,108

PRODUCTION OF ENSEMBLE IN A COMPUTOR ORGAN

Ralph Deutsch, Sherman Oaks, Calif., assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Jan. 11, 1974, Ser. No. 432,684
Int. Cl. G10h *1/02, 5/02*
U.S. Cl. 84—1.24 **12 Claims**



1. In an electronic musical instrument wherein the amplitudes of a waveshape are computed at regular time intervals t_x from stored harmonic coefficients, musical notes being produced from said computed amplitudes as said computations are carried out in real time, the improvement for producing an ensemble effect comprising:

first means for evaluating a set of "combined" Fourier components during subintervals within each time interval t_x, each combined Fourier component being the sum of a first constituent Fourier component at the nominal true-pitch of the selected note and a second constituent Fourier component offset in frequency from the corresponding true-pitch first constituent Fourier component, the first and second constituent Fourier components of corresponding order having an equal amplitude established by said stored harmonic components,

an accumulator, connected to receive said combined Fourier components from said first means, for accumulating all the the combined Fourier components evaluated during each interval t_x to obtain a waveshape amplitude for a certain sample point,

sample point means operative at the end of each interval t_x for incrementing the effective sample point (qR) for which said resultant waveshape amplitude is established and for supplying the effective sample point (qR) value to said first means, and

means, connected to receive said waveshape amplitudes from said accumulator, for converting said resultant waveshape amplitudes to sounds, said converting being carried out, in real time as said waveshape amplitudes are computed, the sounds so produced exhibiting an ensemble effect.

3,884,109

METHOD FOR IMPROVING THE RESONANCES OF STRINGED INSTRUMENTS

Charles S. Johnson, 5208 S. 12th St., Arlington, Va. 22204

Filed Apr. 26, 1974, Ser. No. 464,346
Int. Cl. G10d *1/02*
U.S. Cl. 84—275 **5 Claims**

1. A process for improving the resonances of stringed instruments after assembly thereof comprising the steps of:

temporarily securing the tail piece of said instrument by external means so as to permit said instrument to be strung and concert tuned without the use of the end pin hole of said instrument;

adjusting the air resonance tone of said instrument to a desired pitch by changing the size and shape of the *f*-holes of said instrument;

adjusting the prime wood tone of said instrument to a desired musical interval from said air resonance tone by the steps of:

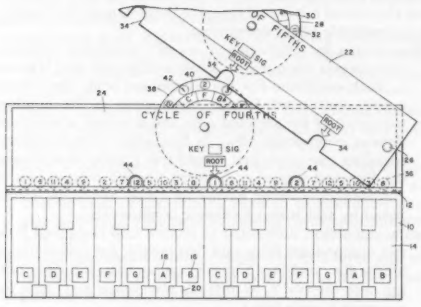
inserting a piece of sandpaper into the air chamber of said instrument through an *f* hole thereof;

introducing a piece of stiff wire through said end pin hole into said air chamber to permit manipulation of said sandpaper by said stiff wire; and

alternately sanding the inside of the back of said instrument and testing said prime wood tone location, until said prime wood tone reaches the desired pitch;

and, bringing said prime wood tone and said air resonance tone into phase by sanding the bass bar of said instrument with said piece of sandpaper manipulated by said piece of stiff wire inserted into said air chamber through said end pin hole.

3,884,110
MUSICAL CYCLE DIFFERENTIATION AID
Verna M. Leonard, 8701 Highway 41, Fresno, Calif. 93710
Filed July 24, 1974, Ser. No. 491,251
Int. Cl. G09b *15/02*
U.S. Cl. 84—471 **4 Claims**



1. A device for teaching the relationship between the cycle of fourths and the cycle of fifths in music comprising:

a. first panel and a second panel, each having:

1. a front face and a rear face; and

2. a disc rotatably mounted on the rear face and extending partially beyond the respective panel;

b. said discs each having displayed consecutively in twelve peripheral sectors the scale tone names of a musical cycle;

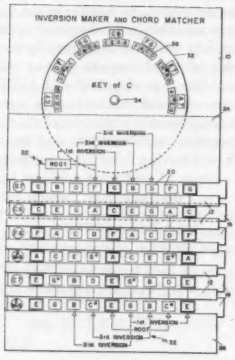
c. said first panel having means to indicate the position on a piano keyboard of a root tone and the two tones which are a fifth interval removed from said root tone on the opposite sides thereof;

d. the cycle displayed on the disc mounted on said first panel being a cycle of fifths and the cycle displayed on the disc mounted on said second panel being a cycle of fourths;

e. said second panel having means to indicate the position on a piano keyboard of a root tone and the two tones which are a fourth interval removed from said root tone on opposite sides thereof; and

f. said panels being mounted together for alternate visibility and use by the student.

3,884,111
INVERSION MAKER AND CHORD MATCHER
Verna M. Leonard, 8701 Highway 41, Fresno, Calif. 93710
Filed July 24, 1974, Ser. No. 491,253
Int. Cl. G09b *15/02*
U.S. Cl. 84—471 **2 Claims**



1. A chord inversion mixer comprising:

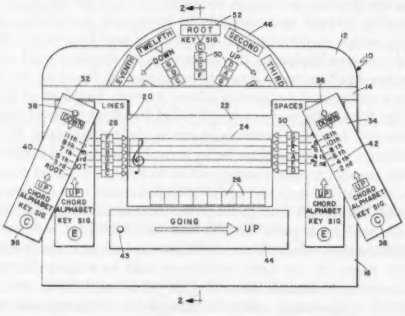
a. A generally planar backing member defining a plurality of parallel laterally extended forwardly open channels;

b. a plurality of elongated panels dimensioned to be individually slideably received in any selected one of said channels;

c. each of said panels being identified with a particular musical chord symbol and having thereon an array of spaced indicia naming the scale tones of the particular chord in more than one octave;

d. indicia on said backing selectively registering with certain ones of the scale tone names and identifying same as components of the root chord and at least one inversion.

3,884,112
KEY SIGNATURE STRUCTURE TEACHING AID
Verna M. Leonard, 8701 Hwy. 41, Fresno, Calif. 93710
Filed July 24, 1974, Ser. No. 491,254
Int. Cl. G09b *15/02*
U.S. Cl. 84—471 **5 Claims**



1. A device for teaching key signature structure comprising:

A base having an upwardly extending rear panel and defining a forwardly disposed upwardly open pocket;

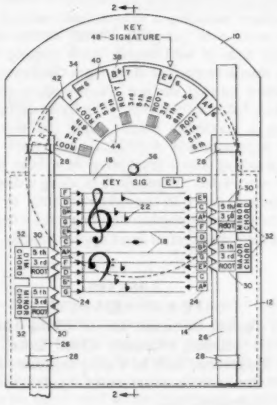
said pocket having a planar front member with a portion thereof cut away to define an aperture with a parallel-sides;

an insert panel having displayed thereon a musical staff and being insertable in said pocket such that said musical staff is revealed through said aperture;

said planar front member having indicia adjacent the parallel sides of said aperture registering with and naming the scale tones of the lines and spaces of the musical staff when said insert panel is inserted; and

a plurality of selectively exposable panel pairs mounted on said planar front member, the panels of each pair being identified with a particular key signature and the first panel in each pair being disposed on one side of said aperture and having indicia thereon to register with the lines of said staff to identify same as the scale degrees of the particular key signature, and the second panel of each pair being disposed on the side of said aperture opposite said one side and having indicia thereon to register with the spaces of the staff to identify same as the scale degrees of the particular key signature.

3,884,113
SLIDE RULE CHORD INDICATOR
Verna M. Leonard, 8701 Highway 41, Fresno, Calif. 93710
Filed July 24, 1974, Ser. No. 491,256
Int. Cl. G09b *15/02*
U.S. Cl. 84—471 **4 Claims**



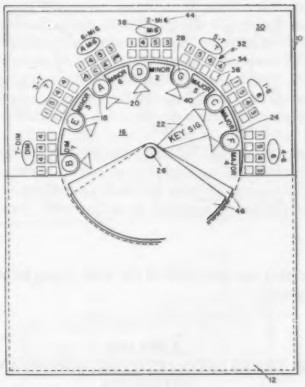
1. A musical teaching aid comprising:

a. an insert sheet identified with a particular key signature and displaying a musical staff having the lines and spaces thereof named according to the scale tones comprising said particular key signature, said named scale tones being displayed in a pair of evenly spaced vertical arrays disposed laterally of said staff;

b. an overlay sheet disposed on said insert sheet and having an opening with parallel side edges to expose said staff and scale tone arrays;

c. a pair of panels vertically slideably mounted on said overlay sheet adjacent the left and right side edges thereof respectively, each of said panels having at least one group of indicators to indicate by juxtaposition with one of said vertical arrays the particular ones of said named scale tones on said insert sheet which define a particular type of chord and naming said particular type of chord.

3,884,114
MAJOR AND MINOR CHORD ORGANIZOR
Verna M. Leonard, 8701 Highway 41, Fresno, Calif. 93710
Filed July 24, 1974, Ser. No. 491,260
Int. Cl. G09b *15/02*
U.S. Cl. 84—471 **6 Claims**



1. An aid for teaching the various major and minor chords related to a particular key signature comprising:

a. a rear panel and a forward panel joined along at least their lower edges to define an envelope therebetween;

b. a dial rotatably mounted to said forward panel and having thereon an evenly spaced angular array of scale tone names arranged according to the cycle of fourths;

c. at least one insert sheet dimensioned to fit within said envelope and having thereon an arcuate array of indicia groups, siad groups being individually alignable radially of said dial with individual ones of said named scale tones upon rotative adjustment of said dial when said sheet is inserted in said envelope;

d. each of said groups of indicia including a representation of a particular chord type such that by using the radially aligned named scale tones as the root tones of the particular chord types particular chords representing the related major and minor chords of a particular key signature are defined;

e. each of said groups of indicia further including spaced writing blanks for the user to inscribe the names of the scale tones of the particular chord defined therein.

3,884,115
INTERVAL TEACHING AID
Verna M. Leonard, 8701 Highway 41, Fresno, Calif.
Filed July 24, 1974, Ser. No. 491,518
Int. Cl. G09b *15/02*
U.S. Cl. 84—471 **4 Claims**

1, A muscial teaching aid comprising:

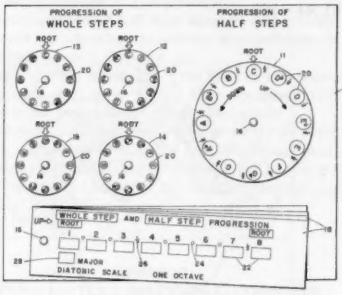
a. a substantially rigid planar base;

b. a first disc rotationally mounted at the center thereof to said base and having on the side thereof remote from the base an angularly spaced peripheral array of indicia indicating in order the scale tone names of the notes of one octave of the chromatic musical scale;

c. a second disc rotationally mounted at the center thereof to said base and having on the side thereof remote from the base an angularly spaced peripheral array of indicia indicating in order the scale tone names of notes of a progression of whole step intervals.

d. a plurality of selectively exposable panels mounted on

said base, each of said panels having thereon ordered spaces for the inscription of scale tone names and indicia



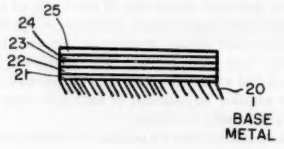
indicating the structure of the scale tones to be named in the spaces.

3,884,116

SCREW THREADED FASTENING MEANS AND LIKE PRODUCTS

Jacob M. Hage, Farmington, Mich., assignor to Midwest Chrome Process Company, Detroit, Mich.

Continuation-in-part of Ser. No. 208,080, Dec. 15, 1971, abandoned. This application May 3, 1972, Ser. No. 249,850
Int. Cl. F16b *25/00;* **B32b** *15/18*
U.S. Cl. 85—1 C **12 Claims**



1. A plated carbon steel threaded fastener means for fastening objects in exterior as well as interior applications, such as in the automotive field and the like, and operative to provide good corrosion resistance properties, and being of a satin-like or shiny appearance, comprising:

a head portion at one end of the fastener means, and

a shank portion,

said fastener means having a structural makeup of separate layers including,

a. structural base metal means of carbon steel,

b. layer means of copper having a thickness between about 0.00001 and about 0.0001 inches,

c. layer means of cadmium having a thickness between about 0.00005 and about 0.0009 inches,

d. layer means of copper having a thickness between about 0.00001 and about 0.0005 inches,

e. layer means of nickel having a thickness between about 0.0001 and about 0.0007 inches,

f. layer means of at least one material selected from the group consisting of a tin/nickel alloy, a tin/cobalt-nickel alloy, or a tin/cobalt alloy, said layer means having a thickness between about 0.000005 and about 0.00020 inches,

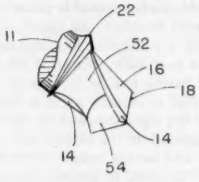
said layer means being for the most part applied by electrolytic coating process and being operative to enable good corrosion resistance properties and good adhesion properties.

3,884,117

DRILLING AND TAPPING SCREW FORMATION

William A. Eager, Cornwall, N.Y., assignor to Star Expansion Industries Corporation, Mountainville, N.Y.

Continuation-in-part of Ser. No. 132,119, April 7, 1971, abandoned. This application Aug. 15, 1973, Ser. No. 388,596
Int. Cl.² F16B *25/00*
U.S. Cl. 85—47 **10 Claims**



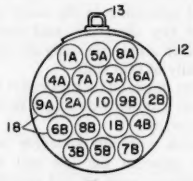
1. A drilling screw comprising an elongate shank including a trailing end portion at one end of said shank and a leading end portion at an opposite end of said shank, an intermediate portion of said shank being threaded for rotation in a predetermined direction and for advancement into a material, said trailing end portion being provided with a manipulating head, said leading end portion including cutting surfaces and relief surfaces each associated with another cutting surface, each cutting surface being angularly advanced about the axis of said shaft with respect to an associated relief surface relative to said predetermined direction of rotation to define a flute, each cutting surface including a substantially smooth leading cutting edge portion of generally lateral extent relative to the longitudinal axis of said shank, each cutting edge portion projecting into a respective flute from the lowermost edge of an associated cutting surface, each cutting portion having dimensions substantially smaller than those defining said flutes and having a maximum height along the direction of said shank of approximately 0.0025 inches, each cutting edge portion projecting into a respective flute from the lowermost edge of an associated cutting surface along a direction normal to the latter a distance in the range of 0.001 to 0.003 inches, and each cutting edge portion defining a rake angle relative to the axis of said shank of at least approximately 45°.

3,884,118

SAFE AND ARM DEVICE

Vincent J. Taylor, deceased, late of China Lake, Calif.; by Wayne G. Zellmer, executor, China Lake, and Earl E. Beasey, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

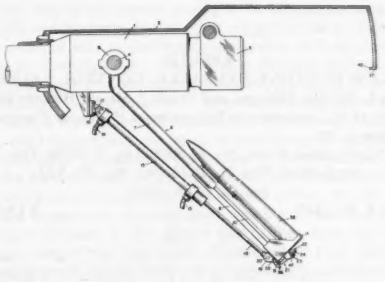
Filed Nov. 23, 1973, Ser. No. 418,623
Int. Cl. F41f *3/06*
U.S. Cl. 89—1.814 **6 Claims**



1. In a weapons firing control system wherein a plurality of weapons may be sequentially or serially fired by electrical current through a plurality of individual circuits, the combination comprising:

A. a source of current;
B. a firing switch;
C. an arming switch;
D. said firing switch and said arming switch being each connected to said source;
E. a plurality of firing circuits;
F. safety switching means connected to said firing switch and having a plurality of two position switches each in one position being connected to respective ones of said firing circuits;
G. said two position switches being biased to the other one of said two positions and said other position connected each of said circuits to ground potential, said switching means being operable for simultaneous movement of said two position switches to said one position thereby connecting said firing circuits to receive current from said firing switch; and
H. electrically operable means responsive to current from said arming switch activating said switching means and thereby moving said two position switches from said other position to said one position.

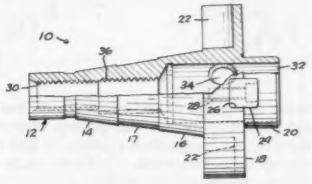
3,884,119
LOADING DEVICE FOR GUNS
Robert L. Zouck, Pikesville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed May 2, 1955, Ser. No. 505,311
Int. Cl. F41d *11/14;* **F41f** *9/00*
U.S. Cl. 89—45 **6 Claims**



1. A loader for a gun, comprising an arm pivoted at one end for swinging motion with respect to said gun, a carriage supported by said arm for reciprocating motion thereon, a telescoping member pivoted at one end for swinging motion with respect to said gun, said telescoping member being pivotally connected at its other end to said carriage, said telescoping member being operable to be retracted and extended, latching means carried by said carriage for latching said carriage to said arm for preventing motion of said carriage with respect to said arm, and latching means carried by said arm for unlatching the first said latching means and simultaneously latching said arm against swinging motion with respect to said gun.

3,884,120
MILLING MACHINE CUTTER ADAPTOR
Frank L. Diferdinando, Malvern, Pa., assignor to Gorham Tool Company, Detroit, Mich.
Filed Nov. 12, 1973, Ser. No. 414,868
Int. Cl. B23b *31/02*
U.S. Cl. 90—11 A **1 Claim**

1. In combination a machine tool spindle adaptor for mounting a plurality of different milling cutters on the spindle, said adaptor comprising an annular body having a rear portion adapted to be telescopically engaged in the forward end of the machine tool spindle, said body having a central bore extending therethrough, the forward end portion of said bore comprising a smooth circular cylindrical surface and the rear end portion of said bore being threaded and of smaller diameter than the forward end portion of the bore, said body having intermediate its ends an enlarged radially outwardly extending circular flange, said flange having a flat front face portion with a pair of radially extending abutment means thereon, said body having an integral circumferentially continuous circular pilot boss extending forwardly from said front face concentric with said bore, the outer diameter of said boss being smaller than the outer diameter of said circular flange, a milling cutter having a central bore telescopically engaged over said pilot boss with a close fit, said cutter having a flat rear face portion positioned against the front face of said flange and having means thereon engaging said abutment means on said flange to establish a rotating driving connection between said adaptor and said cutter, the central bore in said cutter being enlarged adjacent the forward end of the cutter, the smaller diameter portion of the central bore in the cutter having an axial dimension greater than the axial dimension of said pilot boss and said enlarged bore defining a radially outwardly



extending shoulder at the end thereof adjacent the smaller portion of the bore in the cutter, a screw extending axially through the bores in said cutter and adaptor, said screw having its rear end in threaded engagement with the threaded rear end portion of the central bore in said adaptor, the shank of said screw being of smaller diameter than the smooth cylindrical bore in said adaptor, said screw having an enlarged head at the forward end thereof seated against said shoulder to removably retain said cutter on said adaptor, said screw being adapted to be retracted out of said bore to enable removal of said cutter from said adaptor to thereby enable a second milling cutter having a circular cylindrical shank of a diameter corresponding to the central bore of the adaptor to be inserted in the bore of the adaptor, said flange having a radially extending threaded opening therein communicating at its inner end with said smooth diameter bore and a locking screw in said last-mentioned threaded opening adapted when advanced radially inwardly to engage the shank of a milling cutter in said smooth diameter bore for locking the last-mentioned cutter on the adaptor.

3,884,121
KEY CUTTER
Frank P. Agius, 1027 Meyers Road, Alpena, Mich.
Filed June 1, 1971, Ser. No. 148,785
Int. Cl. B23c *3/35*
U.S. Cl. 90—13.05 **12 Claims**

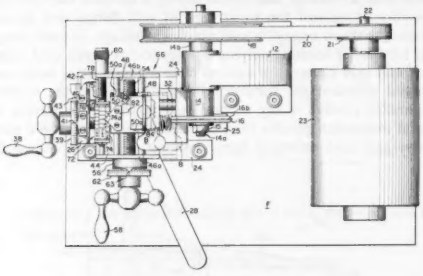
1. Key cutting apparatus for cutting longitudinally spaced notches in the bit of a key blank, said apparatus comprising: a frame;
a main carriage movably mounted on said frame;
a sub-carriage movably mounted on said carriage;
a key blank supporting carriage movably mounted on said sub-carriage;
a movable cutter on said frame;
means for transversely moving a key blank into and out of engagement with said cutter comprising:
means mounting one of said carriages for longitudinal movement and the other two of said carriages for transverse movement toward and away from said cutter; and
means for presetting, before the key blank is moved

into engagement with said cutter, the relative longitudinal and transverse positions of said carriages and said cutter comprising:

indexible means for longitudinally indexing said one carriage a predetermined distance before cutting commences;

additional indexible means for transversely indexing a first carriage of said two carriages before cutting commences; and

means, including micrometer means on said carriages and said indexible means, for gauging the relative



linear movement of said one and said first carriages for presetting before the cutting operation commences, the longitudinal position of said key blank and cutter and the depth of cut to be made when said key blank engages said cutter;

means for transversely moving the other of said two transversely movable carriages to operative cutting position; and

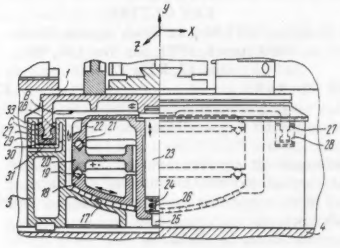
stop means for interrupting the transverse movement of said other of said two transversely movable carriages in the same operative position regardless of the depth of cut to be made in said key blank.

3,884,122

METAL-CUTTING MACHINE FOR MACHINING LOCATING SURFACES

Evgeny Alexandrovich Chernov, Lesnoi prospekt, 75, kv. 15, Leningrad; Arkady Nikolaevich Poletaev, ulitsa Kozlova, 35/1, kv. 112, Minsk; Saul Vulfovich Golod, ulitsa Bronnitskaya, 22, kv. 2; Evgeny Vasilievich Petrov, Prospekt Bolshevikov, 35/1, kv. 7, both of Leningrad; Dmitry Timofeevich Vasiliev, Zubovsky bulvar, 15, kv. 6, Moscow, and Vitold Antonovich Tofpenets, ulitsa Klary Tsetkin, 24, kv. 3, Minsk, all of U.S.S.R.

Filed Nov. 8, 1972, Ser. No. 304,825
Int. Cl. B23q *3/00*
U.S. Cl. 90—58 C **3 Claims**



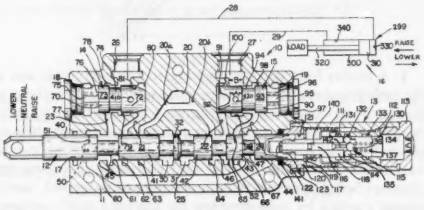
1. A metal-cutting machine for machining locating surfaces, comprising: a bed; a base mounted on said bed; a table for accommodating the workpiece under machining, said table being mounted on said base and having at least two degrees of freedom with respect thereto for an optimum positioning of said workpiece with respect to the cutting tool; a means carrying said cutting tool, mounted on said bed of the machine; at least two table orientation mechanisms whose number depends upon the number of the degrees of freedom of the table, said mechanisms being arranged one upon the other to form a common kinematic chain having the terminal link interconnected with said table carrying the workpiece being machined; a device for a positive locking of said table in a predetermined position with respect to said cutting tool, including an intermediate link "floating" in said base and adapted for a continuous sliding contact with the surface of said table facing said base in the course of the table orienting with respect to said cutting tool; said intermediate link being made as a pair of T-shaped beams, the vertical portion of each of said beams being, during the orientation of said table, in a continuous sliding contact with the butt surface of the base by means of a spring-loaded plate mounted on said base, and being positively forced against said surface in the course of cutting, whereas on the horizontal portion of each of said beams there is located an insert having a cylindrical recess, said insert being so arranged that said recess faces the table surface, said table having cylindrical pins located on its opposite sides respectively to said beams and parallel to said base, said pins with their bottom portions being accommodated in said recesses so as to be in a continuous sliding contact therewith during the table orienting, while the top portions of said pins mount rockers carrying spring-loaded plates which are adapted to positively force the flanges of said beams through said inserts against the respective of the said table pins in the course of cutting; and means for positively locking said intermediate link simultaneously with said table and said base during the course of cutting.

3,884,123

FLOW SENSITIVE HYDRAULIC CONTROL VALVE

Fosco L. DeVita, Chicago, and Frank J. Simak, Hickory Hills, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 61,959, Aug. 7, 1970. This application May 21, 1973, Ser. No. 361,922
Int. Cl. F15b *13/01*
U.S. Cl. 91—447 **4 Claims**



1. In combination, a hydraulic control valve, a source, and a work cylinder having a work piston therein, said valve comprising:

a housing having first and second bores;

a selectively movable control valve member slidable in said first bore;

means for latching said control valve member in a selected position;

a fluid pressure actuated unlatching mechanism capable of releasing said latching means;

a flow sensitive valve piston formed with a fluid sealing land slidably disposed within said second bore;

said housing having a fluid inlet conduit connected with said first bore, a fluid outlet conduit connected with said work cylinder and a fluid return conduit, means in said return conduit connectable to said unlatching mechanism, and all of said conduits opening into said second bore;

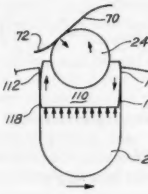
said inlet and return conduits at their juncture with said second bore being spaced apart a distance greater than the axial width of said land;

whereby said land allows fluid to flow from said inlet conduit to said outlet conduit and blocks the passage of fluid to said return conduit and said unlatching mechanism while fluid is flowing from said inlet to said outlet conduits, but permits the same when flow ceases.

3,884,124
HYDRAULIC DEVICE

Robert T. Eddy, South Bend, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.

Filed Apr. 19, 1973, Ser. No. 352,424
Int. Cl. F01b *13/06*
U.S. Cl. 91—487 **13 Claims**

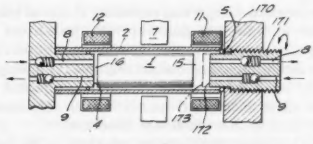


1. A hydraulic device comprising a stator means, a rotor means, one of said means having a plurality of alternate outwardly and inwardly, radially extending reaction surfaces and the other of said means having a plurality of fluid chambers with an opening facing said reaction surfaces, a slipper disposed in each of said chambers for reciprocating movement therein and having a recess in the surface facing said reaction surfaces, a rolling element disposed in said recess and contacting said reaction surfaces, each of said slippers being tiltable to both sides of the radial center line of the respective roller by the motion between the stator and rotor means to form a contact seal with both side walls of its chamber, the side walls of said slippers having a curvature which increases the sealing contact pressure as the slipper tips further from the radial center line of the respective chamber, and fluid inlet and outlet ports being alternately connected with said chambers.

3,884,125
VARIABLE DISPLACEMENT SEALED PUMP

Philip E. Massie, 4220 Irving Pl., Culver City, Calif. 90203

Continuation-in-part of Ser. No. 113,321, Feb. 8, 1971, Pat. No. 3,754,154. This application Nov. 20, 1972, Ser. No. 308,043
Int. Cl. F01b *31/14*; **F15b** *15/24*
U.S. Cl. 92—13.5 **4 Claims**

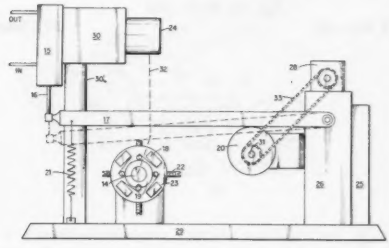


1. A sealed pump comprising: a cylinder having a magnetically actuatable piston therein, the ends of the cylinder being closed and the piston being free from mechanical connections to the exterior of the cylinder; magnetic core means associated with the piston and cylinder; means for magnetically coupling the piston with said magnetic core means, and electrical winding means disposed to produce a magnetic field for reciprocating the piston, said pump having means forming a head in one end of the cylinder, said head means being longitudinally adjustable relative to the cylinder to vary the volume thereof, and means in which the head is mounted, said last means and head having threads comprising helical grooves positioned opposite each other forming a helical channel and means comprising a helical flexible sealing element positioned in the oppositely facing grooves forming the channel.

3,884,126
PROGRAMMABLE POSITIVE DISPLACEMENT PUMP

Wayne F. Johnson, Loudon, and William A. Walker, Knoxville, both of Tenn., assignors to The United States Energy Research and Development Administration, Washington, D.C.

Filed May 23, 1974, Ser. No. 472,930
Int. Cl. F01b *31/14*
U.S. Cl. 92—13.7 **3 Claims**



1. A positive displacement pump for the loading of microliter quantities of chemical reagents or samples into receiving cavities, comprising a base, a closed pump cylinder provided with an inlet tube for supplying a desired liquid thereto and an outlet tube for dispensing a desired volume of said liquid therefrom, said cylinder further provided with a piston and a piston rod extending downwardly from said cylinder, a first support member extending above said base and affixed thereto, said pump cylinder being mounted on said support in spaced relation to said base, a second support member extending above said base and affixed thereto, said support members being widely spaced apart from each other, an actuating arm being affixed at one end thereof to the lower end of said piston rod and pivotally affixed at its other end to said second support member, a spring positioned between and affixed to said base and to said actuating arm adjacent to said one end for exerting a downward force to said one end of said arm, a first rotatable shaft provided with a cam affixed thereto, said shaft being rotatably supported by and above said base in such a position that said affixed cam bears against the underside of said actuating arm intermediate the ends thereof to effect a desired upper limit of travel of said arm as a function of the largest radius of rotation of said cam, a first motor mounted on the upper portion of said second support member, means for coupling said motor to said first shaft for effecting continuous rotation of said cam for thus driving said piston rod into and out of said pump cylinder; and means for selectively limiting the down stroke of said actuating arm by action of said spring comprising a second rotatable shaft provided with an attached wheel, said second shaft being rotatably supported by and above said base between said first shaft and said first support member, said wheel being provided with a plurality of stroke-limiting screws extending radially outward different distances from the wheel circumference, wherein a selected one of said screws functions as a stop for said pump-actuating arm during its downward stroke, a plurality of microswitches mounted on one side face of said wheel and each switch having a spring-operating arm provided with a roller on its end, said second shaft having a slotted ring affixed thereto wherein the slot of said ring is adapted to sequentially actuate each of said microswitches when the associated spring arm

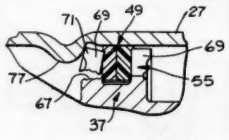
roller is urged into said slot, a second motor mounted on said first support member, a mechanical coupling for coupling said second motor to said second shaft, and means for energizing said second motor including means for selecting one of said microswitches such that said second motor rotates said second shaft until said selected microswitch is actuated to stop rotation of said second shaft by said second motor and the desired one of said stroke-limiting screws is directly beneath said pump-actuating arm whereby a desired volume of said liquid is pumped out of said cylinder outlet tube for each stroke of said pump.

3,884,127

FRANGIBLE CONSTRUCTION AND ACTUATOR UTILIZING SAME

William D. Simmons, Costa Mesa, Calif., assignor to Bertea Corporation, Irvine, Calif.

Filed Jan. 29, 1973, Ser. No. 327,747
Int. Cl. F01b *7/00*
U.S. Cl. 92—151 **30 Claims**



1. An actuator comprising:
a housing including a transverse member, said transverse member having an opening therein, said housing having a chamber therein;
a piston member movable in said chamber, said chamber being adapted to receive fluid under pressure to move said piston member in said chamber;
a connecting rod joined to said piston member and extending through said opening of said transverse member;
at least one of said members having a frangible peripheral region; and
said frangible peripheral region including at least one weakened region defining a plurality of segments which can be broken off of said one member.

29. A system for moving an element comprising:
a first control apparatus including inner and outer relatively movable members;
means for causing the relative movement between said member to cause movement of said element;
second means for causing movement of said element;
at least one of said members being deformable in response to a blow to define an abutment tending to inhibit said relative movement between said members; and
the other of said members including a peripheral region which is frangible so that said peripheral region breaks in response to forcible engagement between said abutment and said peripheral region whereby the formation of said abutment will not prevent relative movement between said members beyond said abutment and said second means is not prevented from causing movement of said element.

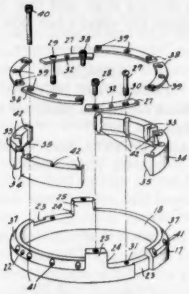
3,884,128

COMBINATION CENTERING BEARING AND STOP FOR CAR LIFT PISTONS

Frederick A. Schick, and Milton H. Brown, both of Springfield, Ill., assignors to Dura Corporation, Springfield, Ill.

Filed July 6, 1972, Ser. No. 269,390
Int. Cl. F16j *15/18*
U.S. Cl. 92—168 **12 Claims**

1. In combination, a piston and a cylinder, said piston centered in and being of a smaller diameter than the cylinder:
a bearing member having a complete ring shaped bearing surface sized to the diameter of the piston and guidingly slidably engaged therewith;
means connecting said bearing member in fixed axial position in the cylinder;



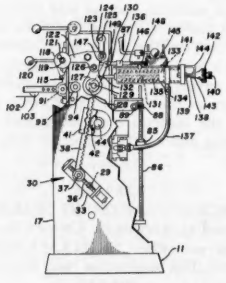
centering take-up wedging means; and
means attached to said bearing member and adjustably securing said wedging means in centering take-up relation to and between said bearing member and said cylinder.

3,884,129

INTERMITTENT WEB DRIVE MECHANISM EMPLOYING UNIDIRECTIONAL CLUTCHES

Thomas J. Monahan, Swansea, Mass., assignor to G. T. Schjeldahl Company, Northfield, Minn.

Filed Apr. 10, 1973, Ser. No. 349,778
Int. Cl. B31b *1/10*; **74** *125.5;120;121*
U.S. Cl. 93—8 R **9 Claims**



1. Means for intermittently advancing a web of flexible film comprising:
a. drive means for imparting repeating cycles of intermittent motion and dwell to said web with the motion normally being along a certain predetermined web direction, said drive means including output shaft means having first and second input driver means operatively coupled thereto;
b. input shaft means and means for drivably rotating said input shaft in one rotational direction;
c. unitary output shaft means adapted to be operatively coupled to said web for imparting motion thereto;
d. first and second driver means arranged in phased relationship one-to-another and being responsive to the rotation of said input shaft means and operatively coupled to said output shaft for drivably rotating said output shaft in one rotational direction, each driver means being effective for the rotation of said output shaft for a driving cycle of said output shaft, with continuously varying rates of rotational velocity having acceleration from dwell to

maximum velocity and deceleration from maximum velocity to dwell, and further being effective only during one-half of each rotational cycle imparted to each of said driver means by said input shaft;

e. means including first unidirectional clutch means inter-coupling said first driver means to said input and output shafts for initiating rotation of said output shaft and for continuing said rotation for a first motion segment not exceeding one-half cycle of rotation of said input shaft and for de-coupling said first driver means at the end of said first motion segment;

f. means including second unidirectional clutch means for intermittently inter-coupling said second driver means to said input and output shafts in phased relationship to said first driver means and for achieving over-riding de-coupling of said first driver means from said output shaft for continuing rotation of said output shaft for a second motion segment not exceeding one-half cycle of rotation of said input shaft and for de-coupling said second driver means upon completion of said second motion segment; and

g. means for maintaining said output shaft means in locked disposition while said first driver means and said second driver means are simultaneously de-coupled from said output shaft to impart a dwell cycle to said web.

3,884,130

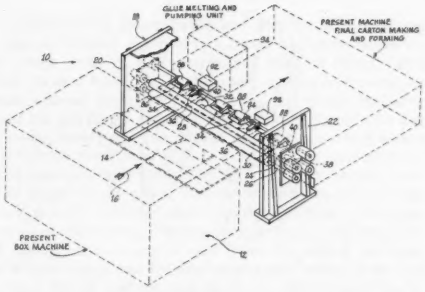
APPARATUS FOR PRODUCING CARTONS

Walter J. Stolkin, Chicago; William A. Riley, Woodridge, both of Ill., and Henry J. Sejda, Munster, Ind., assignors to Stolmar Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 350,936, April 13, 1973, abandoned. This application Mar. 25, 1974, Ser. No. 454,256

Int. Cl. B31b *1/36*

U.S. Cl. 93—49 R **23 Claims**



1. An apparatus for producing a folded carton comprising a bed for supporting a carton blank, said blank including side panels and bottom panels connected to the side panels, means defined by said bottom panels for holding the bottom panels together when the carton is unfolded, said bottom panels being situated in side-by-side relationship in said blank, flaps defined by at least one of said bottom panels, first folding means for folding the bottom panels in over-lying relationship relative to adjacent side panels, second folding means for engaging said flaps to thereby fold said flaps over onto the bottom panels carrying the flaps, means for applying adhesive to selected surface portions of said bottom panels, third folding means for folding each end of the blank over onto inside portions of the blank, each blank end comprising a side and bottom panel, the adhesive on said blank being positioned for contact with said flaps to secure said ends in the folded position, and means for securing said ends together.

3,884,131

METHOD OF, AND MEANS FOR FOLDING A CONTAINER BLANK INTO A TUBULAR BODY

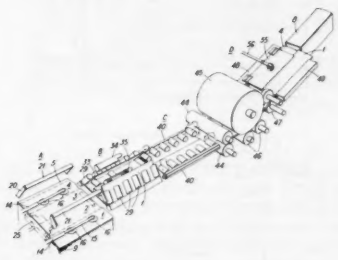
Jan F. Palsson, Lund, Sweden, assignor to Tetra Pak Developement S.A., Lausanne, Switzerland

Filed July 16, 1973, Ser. No. 379,401

Claims priority, application Sweden, Aug. 25, 1972, 12632/72

Int. Cl. B31b *5/26*

U.S. Cl. 93—49 M **25 Claims**



1. A method of forming a tubular container body from a flat blank of package-forming material having a heat-sealable surface, said blank having four side-by-side panels, one of said outer panels including an outer sealing flap therealong, said panels and flap being separated by parallel fold lines therebetween comprising the steps of simultaneously folding up the two outer panels about their fold lines to positions upstanding from the plane of the inner panels, heating the outer edge zones of the upstanding panels, folding the upstanding panels down toward the inner panels so that the heated edge zones overlap, applying pressure to the overlapping edge zones to seal said edge zones together, flexing said folded and sealed blank to break the fold lines and squaring said flexed blank to form the tubular container body.

3,884,132

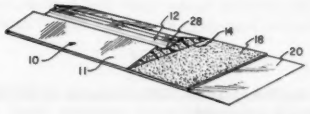
MAGNETICALLY LOCATED SCORING DIE MATRIX

Frank M. Snodgrass, Martinsburg, W. Va., assignor to Channel Creasing Matrix, Inc., Martinsburg, W. Va.

Filed Jan. 11, 1974, Ser. No. 432,500

Int. Cl. B32b *3/00;* **B31b** *1/44*

U.S. Cl. 93—59 MT **7 Claims**



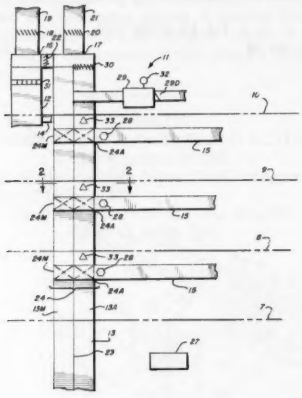
1. A creasing matrix for use in cooperation with a creasing rule to form a crease in a blank of card-like material comprising an elongate element having an upwardly facing side and a downwardly facing side, said upwardly facing side defining a longitudinal channel along said element and said downwardly facing side comprising a substantially planar surface, a pressure-sensitive adhesive layer contiguous with said planar surface, and a magnetic assembly integrally associated with said elongate element along the length thereof.

3,884,133

FIRE CONTROL SYSTEM FOR MULTI-ZONE BUILDINGS

Edward J. Miller, 6702 Church St., Morton Grove, Ill. 60053

Filed Aug. 21, 1974, Ser. No. 499,129
Int. Cl. A62b 15/00; A62c 3/14
U.S. Cl. 98—33 R 14 Claims



1. In a multi-zone building having a ventilation system that includes a central station serving a plurality of ventilation zones, common supply air duct means connecting the central station to the ventilation zones, common return air duct means connecting the ventilation zones to the central station, each zone having branch supply duct means connected to the common supply air duct means and branch return duct means connected to the common return air duct means, and the central station including central supply fan means, central exhaust/return fan means and main damper means for controlling flow of fresh air into the common supply air duct means and recycling of return air from the common return air duct means to the common supply air duct means, the improvement comprising partition means for dividing the common return air duct means lengthwise into a main return air duct section and an auxiliary return air duct section, separate branch damper means for each zone for controlling communication of the branch return duct means of such zone with each of the return air duct sections, standby means for effecting isolation and exhaust of all return air from the auxiliary return air duct section, and control means including separate detection means for each zone operable upon the occurrence of fire conditions therein for actuating the standby means and the corresponding one of said separate damper means for directing all of the return air from any fire zone to exhaust through the auxiliary return air duct section and for directing all of the return air from any non-fire zone into the main return air duct section.

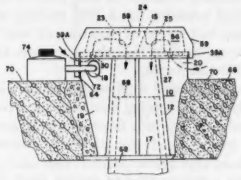
3,884,134

AIR VENT

Edward J. Jordan, Mentor, Ohio, assignor to Jet Aeration Company, Cleveland, Ohio

Filed Jan. 25, 1974, Ser. No. 436,655
Int. Cl. F24f 7/02
U.S. Cl. 98—64 11 Claims

1. An air vent, comprising in combination:
a vent body including a substantially vertical vent duct,
a top member extending outwardly from said vent duct,
rib means extending from the outside surface of said vent duct for supporting said top member;
a cover including a top portion and a side portion established to cover said top member when said cover is located on said vent body;
vent aperture means in one of said top member and said side portion and shielded by at least a portion of said cover when said cover is on said vent body,
a plurality of cover projections extending from said vent body in a generally vertical direction for supporting said cover;



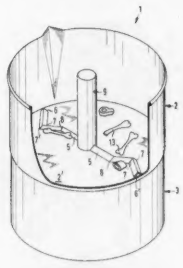
means for securing said cover on said vent body to form an air passage between said vent aperture means and said vent duct;
and a screen assembly mounted in said vent duct to provide a screen in said air passage of said air vent.

3,884,135

COOKING APPLIANCE

Alfred Löhr, Bochum; Wolfgang Tschek, Westerholt; Heinz Förster, Gelsenkirchen-Buer; Bernhard Klauk, Gelsenkirchen, and Wolfgang Schwan, Gelsenkirchen-Erle, all of Germany, assignors to F. Kuppersbusch & Söhne Aktiengesellschaft, Gelsenkirchen, Germany

Filed June 9, 1972, Ser. No. 261,338
Claims priority, application Germany, June 9, 1971, 2128686; Oct. 16, 1971, 2151576; Jan. 12, 1972, 2201200
Int. Cl. B01f 7/18, 15/06
U.S. Cl. 99—348 10 Claims



1. In a cooking appliance including a cooker for holding the ingredients to be cooked, the cooker having a bottom surface, means for heating the cooker, a stirring element for stirring the ingredients to be cooked, and means for driving the stirring element about a substantially vertical axis of the cooker, the improvement comprising in combination:
a. a post member disposed coextensively with said axis and extending to said bottom, said post member forming part of said means driving said stirring element, said post member being arranged for rotation about said axis;
b. two arms affixed to said post member and extending therefrom in opposite direction adjacent and parallel to said bottom, said arms forming part of said stirring element, each of said arms including, over its length, a first arm portion, a second arm portion adjoining end-to-end said first arm portion at a first angle and a third arm portion adjoining end-to-end said second arm portion at a second angle, in each arm one of said angles is an acute angle and the other of said angles is an obtuse angle, one of said angles in each arm being oriented in the direction

of rotation of said post member, the other angle in each arm being oriented opposite the direction of rotation of said post member; and

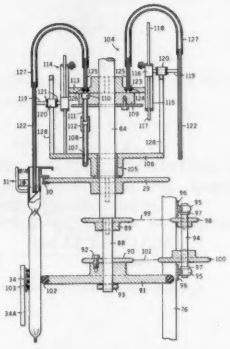
c. a scraper attached to and extending along each arm, said scraper forming part of said stirring element and cooperating with said bottom for scraping the same upon rotation of said post member.

3,884,136

EGG ROLL ASSEMBLY MACHINE

Jack R. Towry, Clayton, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Filed Aug. 24, 1972, Ser. No. 283,346
Int. Cl. B32b *31/04*
U.S. Cl. 99—450.4 **23 Claims**



1. Apparatus for automatically and continuously assembling an egg roll product comprising a frame, conveyor means on said frame defining a predetermined path of travel, drive means on said frame for continuously driving said conveyor means without interruption, said conveyor means including means for grippingly engaging and retaining thereon an egg roll casing having one end thereof open, first metering means on said frame positioned above a portion of the path of travel of said conveyor means for discharging a predetermined quantity of liquid albumen into said continuously moving casing, second means positioned above another position of the path of travel of said conveyor means for inserting a yolk body into said casing, other means on said frame for sealing the open end of said casing and for discharging said casing from said conveyor means, and rotating means on said frame adjacent to said sealing means for rotating the casing to close the open end thereof prior to the sealing thereof.

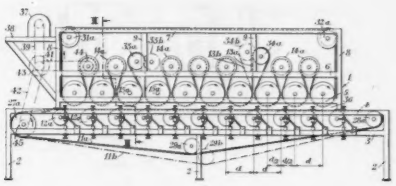
3,884,137

KERNEL FRUIT SHELLING MACHINE

Lucien Breton, Route de Chalais, 16300 Barbezieux, France

Filed Dec. 6, 1973, Ser. No. 422,541
Claims priority, application France, Dec. 14, 1972, 72.44510
Int. Cl. A23n *5/10*
U.S. Cl. 99—625 **9 Claims**

1. A machine for shelling kernel fruits, which comprises a pair of endless belts driven at different linear speads and providing between operative runs thereof a space through which the kernel fruits to be shelled are caused to travel in order to shell them by frictional action after a preliminary suitable treatment has been applied to their skin or hull, a first set of rollers having parallel axes, which are spaced from each other and disposed substantially in the same horizontal plane in order to guide the operative run of the first belt along a substantially rectilinear horizontal path bounding the lower side of said space, and a second set of rollers having parallel axes also parallel to the axes of the rollers of said first set, wherein the rollers of said second set are so disposed as to cause the operative run of said second belt to follow a sinuous path bounding the upper side of said space and to move by turns towards and away from said rectilinear path, said sinu-



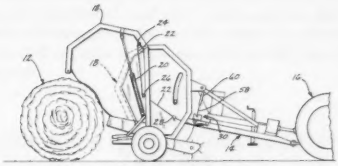
ous path of the operative run of said second belt having points which are nearest to said rectilinear path of said first belt to provide respective friction areas through which said kernel fruits pass and are engaged by both belts, each of said friction areas being transversely spaced substantially equally between points where two adjacent rollers of said first set support said first belt, said belts providing substantially triangular gaps between said friction areas of a size to permit said kernel fruits to overturn on said first belt.

3,884,138

TWINE CUTTING APPARATUS FOR A HAY BALER

Jerry M. Rice, Route 2, Hedrick, Iowa 52563

Filed Apr. 3, 1974, Ser. No. 457,568
Int. Cl. B65b *63/04*
U.S. Cl. 100—5 **6 Claims**



1. In combination with a baler having a twine tying means and a movable tail gate which is adapted to open to eject the bale therefrom, comprising, a support means secured to the baler,

a blade means operatively pivotally secured to said support means for cutting the twine,

and means connecting the baler tail gate and said blade means so that said blade means automatically cuts the twine as the tail gate moves to its open position.

3,884,139

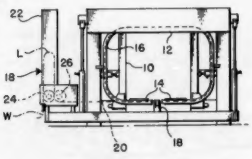
WIRE FEEDING AND TENSIONING APPARATUS

James A. Pasic, Aberdeen, Wash., assignor to Ovalstrapping, Inc., Hoquiam, Wash.

Filed June 12, 1973, Ser. No. 369,168
Int. Cl. B65b *13/04*
U.S. Cl. 100—26 **5 Claims**

1. In a tying machine having a supply of wire or like binding material fed to guiding means surrounding the object to be bound and having a twisting mechanism to lock the ends of the wire together, the improvement comprising combined accumulating and feeding and tensioning means for feeding the wire to the guiding means in one direction and tensioning the wire in the opposite direction, including first and second rolls

having peripheral surfaces engaging the binding material therebetween and rotating in a first direction for feeding and in an opposite, second direction for tensioning, and a storage compartment having an opening therein adjacent said second roll, said binding material being entrained on a substantial portion of the circumference of said peripheral surface of said



second roll, said substantial portion facing directly into said storage compartment, whereby a loop of said binding material preformed by engaging the substantial portion of said peripheral surface of said second roll will expand into said storage compartment when said rollers are rotating in said second direction.

3,884,140

CALENDAR HAVING ADJUSTABLE BRAKE MEANS

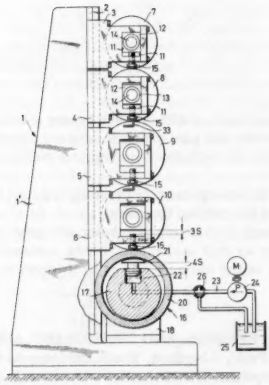
Alfred Christ, Zurich, and Rolf Lehmann, Mutschellen, both of Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland

Filed Mar. 27, 1974, Ser. No. 455,302

Claims priority, application Switzerland, Apr. 17, 1973, 5454/73

Int. Cl. B30b *3/04*

U.S. Cl. 100—163 R **10 Claims**



1. In combination with a calendar having a plurality of superjacent rolls, at least some of said rolls being movably mounted to descend upon opening of the calendar; a plurality of individually adjustable brake means associated with each movable roll for adjusting the velocity of each said roll during descent whereby the lowermost rolls move at a greater descending velocity than the uppermost rolls.

3,884,141

CALENDAR HAVING A DISPLACEABLE SUPPORT CYLINDER

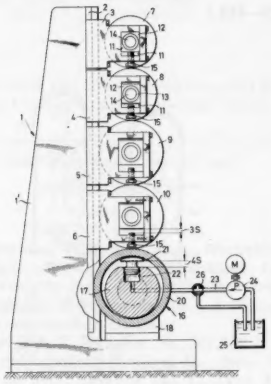
Rolf Lehmann, Mutschellen, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Mar. 27, 1974, Ser. No. 455,357

Claims priority, application Switzerland, Apr. 17, 1973, 5452/73

Int. Cl. B30b *3/04*

U.S. Cl. 100—163 R **3 Claims**



1. A calendar comprising

a plurality of superjacent rolls, said rolls being mounted for movement away from each other to form gaps therebetween upon opening of the calendar; and

a pressure cylinder disposed under said rolls, said cylinder including a stationary support member, a roll barrel rotatably mounted about said support member to support said rolls and at least one hydrostatic support element supporting said roll barrel on said support member, said hydrostatic support element being displaceable to permit movement of said roll barrel away from said rolls over a distance equal to an amount at least equal to the sum of the maximum gaps between said superjacent rolls upon opening of the calendar.

3,884,142

MACHINE FRAME, HAVING A BIASED WIRE GIRDLE, AND A METHOD FOR BIASING SUCH A GIRDLE

Finn Lennart Jonsson, Ystad, Sweden, assignor to AB Carbox, Ystad, Sweden

Filed Jan. 9, 1974, Ser. No. 431,874

Claims priority, application Sweden, Jan. 19, 1973, 7300775

Int. Cl. B30b *15/28*

U.S. Cl. 100—214 **8 Claims**

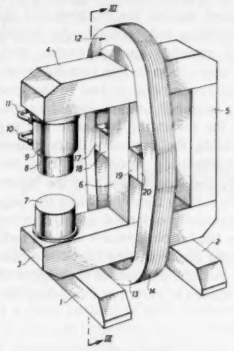
2. A machine frame, particularly for heavy presses, comprising:

a frame member,

a girdle including bias elements surrounding said frame member for applying compressional forces to said frame member to counteract outwardly directed reactional forces to which said frame member is exposed in the operation of the machine, and

girdle expansion means mounted between said girdle and said frame member for expanding said girdle subsequent

to said girdle being mounted on said frame member, the biasing of said bias elements being generated by expansion of said girdle under the influence of said girdle expansion means.



3,884,143

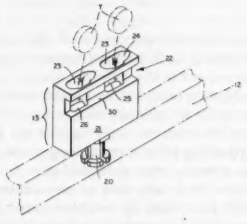
CONVEYOR LINK FOR TABLET PRINTING APPARATUS

Edward M. Ackley, Stone Harbor, N.J., assignor to R. W. Hartnett Company, Philadelphia, Pa.

Filed Sept. 4, 1973, Ser. No. 393,963

Int. Cl. B41f *17/36*

U.S. Cl. 101—37 **5 Claims**



1. In an apparatus for printing indicia on objects of substantially uniform size and shape, which apparatus includes continuously operable conveyor means and printing means adjacent said conveyor means for applying such indicia while said objects are moving along on said conveyor means, a carrier for at least one of said objects, said carrier comprising a supporting base connectable to said conveyor and a body portion supported by said base, said body portion having a recess extending along the direction of movement of said conveyor and shaped to accommodate and receive said printing means therein while said carrier is moving relative to said printing means, and said body portion also having a passageway which is open at an upper portion of said body portion, said passageway extending downwardly within said body portion forming a cavity having an object-supporting floor located below at least a part of said recess, said cavity opening into said recess for communication therebetween, and said body portion having retainer means spaced apart from one another at a distance less than a predetermined dimension of said object in a manner to limit movement of said object out of said passageway in the direction of said recess, said retainer means being provided with an indentation shaped to provide spacing between said retainer means and printed portions of said object, thereby providing for passage of said object out of said passageway without smearing the printed surface of said object against said retaining means.

3,884,144

COMPACT PRINTER

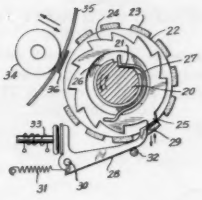
Tadayoshi Shimodaira, Matsumoto, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed June 22, 1973, Ser. No. 372,563

Claims priority, application Japan, June 22, 1972, 47-61795; Nov. 2, 1972, 47-109941

Int. Cl. B41j *1/22*

U.S. Cl. 101—99 **6 Claims**



1. A compact printer comprising a rotary drive shaft having an axially extending notch therein, said drive shaft being rotatable in first and second directions, at least one print carrier carrying at least one print character on the periphery thereof rotatably mounted on said drive shaft, said at least one print carrier being rotatable in first and second directions corresponding to said rotary drive shaft, a resilient spring for rotating said at least one print carrier through print selection and reset sequences, respectively, corresponding to said first and second directions thereof, said spring being driven by said notched drive shaft, said spring having a fixed end and a free end, said fixed end of said spring being fixedly connected to said at least one print carrier, said free end of said spring having an elbow releasably engageable in said drive shaft notch, said notch in said drive shaft providing a drive seat for said free end of said spring for said drive shaft to thereby drive said spring, displaceable print means for imprinting a selected character carried on said at least one print carrier on an imprint receiver, and means for selectively releasably locking the position of said print carrier against the driving action of said drive shaft for thereby aligning a selected character carried on said at least one print carrier in said print means path.

3,884,145

DOCTOR BLADE FOR PHOTOGRAVURE PRINTING MACHINE

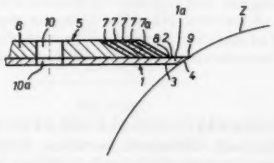
Max Dätwyler, Bleienbach, Switzerland, assignor to Max Dätwyler & Co., Bleienbach, Switzerland

Filed Sept. 17, 1973, Ser. No. 397,877

Claims priority, application Switzerland, Sept. 19, 1972, 13706/72

Int. Cl. B41f *35/00*

U.S. Cl. 101—169 **14 Claims**



1. A doctor blade assembly for photogravure printing machines for the removal of excess printing ink from a printing surface comprising an elongated doctor blade having opposite longitudinal edge portions one of which has a contact surface adapted to contact a printing surface, a strengthening element secured to said doctor blade therealong and having a longitudinal edge terminating short of said contact surface, a plurality

of individually connected though sequentially removable means between said longitudinal edge and said contact surface for supportive back-up of said one edge portion and for sequentially reducing the length of said removable means in a direction away from said contact surface whereby the distance between the last of said removable means and said contact surface is maintained essentially constant during the progressive wear of said doctor blade one edge portion.

3,884,146

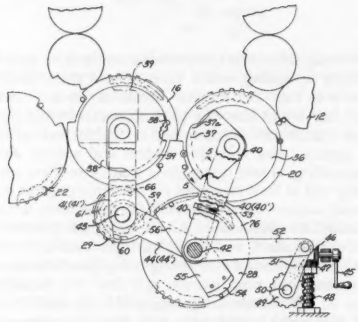
PRINTING PRESS WITH SHEET TURNOVER MECHANISM

Rudolph H. Ruetschle, Solon, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Jan. 20, 1972, Ser. No. 219,273

Int. Cl. B41f *5/02*

U.S. Cl. 101—183 **35 Claims**



19. In a sheet handling apparatus, a first cylinder having first means for gripping a sheet by a first edge of the sheet with the first edge leading, a downstream cylinder having second grippers to which said sheet is to be conveyeed turned over and with said first edge trailing and a second edge opposite said first edge leading, sheet turnover means for turning a sheet over intermediate said first cylinder and said downstream cylinder comprising a second cylinder defining a first sheet transfer nip with said first cylinder and a third cylinder defining a second sheet transfer nip with said downstream cylinder and a sheet transfer nip with said second cylinder, said sheet turnover means having sheet gripping means for receiving a sheet at said first transfer nip and transferring it to said downstream cylinder at said second sheet transfer nip including turnover additional gripping means on one of said second and third cylinders for gripping the trailing edge of a sheet on an adjacent one of said cylinders to take the sheet from the adjacent cylinder and to convey the sheet to an adjacent cylinder downstream with said second edge leading, and adjusting means for adjusting said second and third cylinders about the axis of said first and downstream cylinders while maintaining the sheet transfer nip therebetween to adjust the location of said first and second transfer nips to adjust the timing of of said sheet turnover means with the sheet grippers on said downstream cylinder for different length sheets.

3,884,147

DEVICE FOR FASTENING FLEXIBLE PRINTING PLATES

Paul Abendroth, Offenbach, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

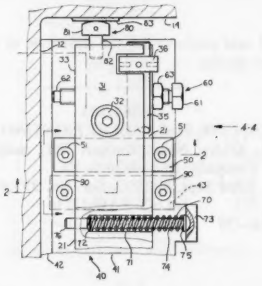
Filed May 21, 1973, Ser. No. 362,182

Claims priority, application Germany, May 26, 1972, 2225333

Int. Cl. B41f *27/12*

U.S. Cl. 101—415.1 **1 Claim**

1. In a plate lock-up mechanism for securing and adjusting a flexible printing plate upon a plate cylinder which has a longitudinal groove formed therein defined by side walls, end walls and generally flat bottom wall, the combination comprising a supporting plate member of L cross section made up of horizontal and vertical portions at right angles to one another respectively seated against the bottom and side wall of the groove and extending substantially the length thereof, the supporting plate member having bracket means along one edge in spaced opposition to the vertical portion, a plurality of mounting bars spaced end to end in the groove above the supporting plate member, means including guide bars interposed between the mounting bars and the supporting plate member for holding the mounting bars individually captive thereon while permitting limited shifting movement both circumferentially and axially, each of the mounting bars having a coextensive rail for tightly holding the edge of a printing plate, circumferentially oriented springs interposingly compressed between the bracket means and the individual mounting bars for biasing the mounting bars circumferentially in the direction of the vertical portion of the supporting plate member, first screw means in each bar extending circumferentially



bearing against the vertical portion of the supporting plate member for adjusting each bar and its printing plate circumferentially with respect to the cylinder, second screw means in each bar for adjusting each bar and plate axially with respect to the cylinder, and a set of supporting screws for clamping the supporting plate member securely against the bottom of the groove, the supporting plate screws being positioned such that the axes of the screws, when extended past the head ends of the screws, are substantially free of any obstruction by any other part of the plate lock-up mechanism so that the screws are readily accessible for easy and unobstructed application of an unscrewing tool notwithstanding the presence of the plate mounting bars whereby, upon removal of the screws, the supporting plate member and the mounting bars and associated biasing springs which are captive thereon may be removed as a unit from the cylinder while preserving the adjusted positions of the bars relative to the supporting plate member and while preserving the compressed condition of the biasing springs for substitution in the groove of a single plate mounting bar extending the length thereof.

3,884,148

METHODS OF IMPROVING PRINTING RESOLUTION IN CHAIN TYPE PRINTERS

Louis Bergeron, Ballainvilliers, France, assignor to Centre National d'Etudes Spatiales, Paris, France

Filed Dec. 14, 1972, Ser. No. 315,193

Claims priority, application France, Dec. 15, 1971, 71.45081

Int. Cl. B41j *3/00*

U.S. Cl. 101—426 **2 Claims**

1. The method of printing patterns of variable resolution with a printer having a font of characters to be printed out in at least one print position of known dimensions, said printer being equipped with a memory and controllable by a printing program, comprising the steps of

1. replacing the font of characters with a set of printing elements each located in a discrete one of a number N of matrix positions within said dimensions,
2. providing for each of said N matrix positions a plurality of elements of different size,
3. identifying each matrix element including those elements of different size with a separate coded representation to be stored in said memory,

4. controlling the printer to print out N times at each print position to form a print out pattern at said N matrix positions, and
5. identifying a print pattern of said elements to be printed out at each said print position by a corresponding set of said coded representations stored in said memory designating the size of the element to be printed out in each of said N matrix positions.

3,884,149

PRINTING PROCESS INCLUDING PHYSICAL DEVELOPMENT OF THE PRINTING PLATE IMAGE

Roger W. Shores, Weymouth, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Jan. 2, 1974, Ser. No. 430,109
Int. Cl. B41m *1/00;* **B04n** *1/00;* **G03c** *5/24*
U.S. Cl. 101—450 **4 Claims**

1. Printing process comprising:

a. forming a catalytic nuclei image on a copy medium comprising a superficially roughened substrate and which image is capable of causing metal deposition from a physical developer comprising a solution of reducible metal ions;

b. uniformly and rapidly wetting said imaged copy medium with a thin layer of said physical developer;

c. subjecting the imaged plate and the thin layer of physical developer to a rocking motion to cause the physical developer to flow back and forth across the catalytic nuclei image in predominantly laminar flow, said rocking motion being between about 2° and about 6° pitch at a rate of between about 2 and about 12 cycles per minute to provide a substantially uniform source of metal ions in all portions of the catalytic nuclei image areas to form metal images adherently and intimately bonded to the substrate of the copy medium;

d. contacting the surface of the imaged medium with a lithographic printing ink which selectively adheres to the image or non-image areas; and

e. contacting the inked medium with a receptor sheet for said ink to thereby form a print of the original.

3,884,150

HYDROSTATIC DELAY ACTION FUSE

John A. Brennan, Hyattsville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 29, 1970, Ser. No. 64,914
Int. Cl. F42c *5/00, 9/14*
U.S. Cl. 102—16 **4 Claims**

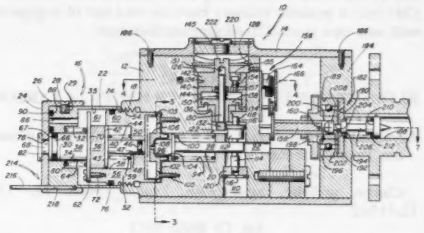
1. A hydrostatic delay action fuse comprising:

a substantially cylindrical fuse housing;

means positioned within said housing for sensing changes in hydrostatic pressure;

means connected to an end of said housing for preventing said pressure sensing means from being exposed to ambient pressure for a predetermined time;

sprocket means, including a female sprocket geared to said pressure sensing means and a male sprocket adapted to mesh with said female sprocket in one of a plurality of positions and a compression spring normally biasing said male sprocket into meshed contact with said female sprocket, for converting changes in the ambient pressure into rotary motion;



a firing pin slideably held within said housing;

release means operably connected to said firing pin for controlling the operation thereof;

time delay means cooperatively associated with said firing pin release means for delayably actuating said release means a predetermined time interval after the initiation of the timing sequence of said time delay means; and

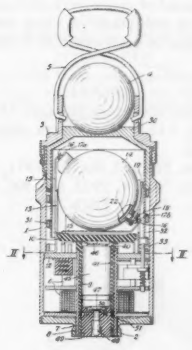
means connected to said sprocket means and rotatable therewith for initiating said time delay means in response to a predetermined rotation of said sprocket means.

3,884,151

DETONATOR FOR LAND MINES

Paul Madlener, Karlsruhe-Durlach, and Otto Pecksen, Herrenalb near Karlsruhe, both of Germany, assignors to Industrie-Werke Karlsruhe Augsburg Akt., Karlsruhe, Germany

Filed June 15, 1966, Ser. No. 559,043
Int. Cl. F42b *23/26*
U.S. Cl. 102—19.2 **7 Claims**



1. In a detonator for a land mine, a detonator housing having mounted therein an electrically ignitable detonator pellet, electric circuit means for controlling the ignition of said pellet, a drive mechanism controlled by a switch member (33) in said circuit means for delaying the ignition of said pellet for a predetermined period of time, a movable contact device subject to a change of position of said housing with respect to an initial position for closing a portion of said electric circuit means when a change of the position of said housing from its initial position takes place, gravity controlled means for mov-

ing said movable contact device into said initial position in which said portion of said circuit means is open, a slidable member (32) in said housing, said electrical circuit means also including two spaced fixed contact members (36, 37) and a movable contact member (35) therebetween, said slidable member when moved in one direction actuating said switch member (33) to start the operation of said driving mechanism and at the same time moving said movable contact member (35) into a position midway between and out of engagement with said two spaced fixed contact members.

3,884,152

ELEMENT FOR A TRANSPORTER HAVING A VARIABLE SPEED

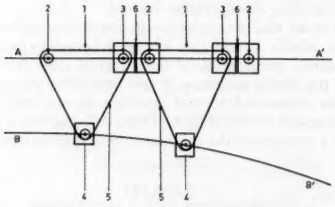
Raymond Emeriat, Nimes, France, assignor to Regie Autonome des Transports Parisiens, Paris, France

Filed Nov. 21, 1973, Ser. No. 417,721

Claims priority, application France, Nov. 22, 1972, 72.41562

Int. Cl. B66b *9/12*

U.S. Cl. 104—25 **6 Claims**



1. A transporter having a variable speed comprising variable units providing said variable speed and formed by displacement members adapted to move along a guide path, control members adapted to follow a cam and non-elastic linkages connecting the displacement members and the control members belonging to the same variable unit, the various variable units being connected by assembly elements, each linkage being formed by at least one chain only able to bend in a half-plane and formed of chain-links, and carrying on its face turned towards the half-plane, a lining cooperating with a corresponding lining on each assembly element.

3,884,153

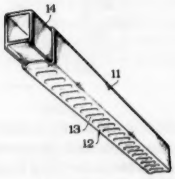
MONORAIL STRUCTURE

Minoru Sugimoto, 141-1 Minamikoto, Jodo-cho, Jodo-gun, Okayama, Japan

Division of Ser. No. 211,312, Dec. 23, 1971, abandoned. This application Nov. 8, 1973, Ser. No. 414,167

Int. Cl. E01b *25/22*

U.S. Cl. 104—93 **7 Claims**



1. A monorail structure, comprising:

a rail body comprising a pipe member having a rectangular cross-section, and

a rack portion on an outer surface of said pipe member integrally formed with teeth by deformation of the material of said pipe member.

3,884,154

PROPULSION ARRANGEMENT EQUIPPED WITH A LINEAR MOTOR

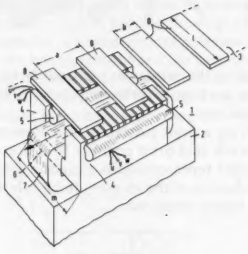
Fritz Marten, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 18, 1972, Ser. No. 315,933

Claims priority, application Germany, Dec. 23, 1971, 2164078

Int. Cl. B61b *13/08*

U.S. Cl. 104—148 MS **9 Claims**



1. A propulsion arrangement for a body movable along a track defining a direction of motion, the body being subjected to outer forces such as centrifugal forces, comprising a winding carrier assembly including two ferromagnetic winding carriers disposed next to each other transversely to the direction of motion, said carriers having respective outermost outside surfaces extending in the direction of motion and facing away from each other, said surfaces being spaced a distance m from each other, a common direct-current excitation winding mounted on said carriers, additional windings mounted on said winding carriers for developing a travelling wave, said additional windings being displaced one from the other by one pole pitch τ_p; and ferromagnetic return means for coacting with said winding carrier assembly for developing a propulsion force for moving the body, said ferromagnetic return means comprising a plurality of ferromagnetic bars arranged in a row transverse to the direction of motion, each of said bars having a length corresponding to said distance m and being a width b having a value defined by the relation: $b \leq \tau_p$, and each two mutually adjacent ones of said bars having a center-to-center spacing corresponding to twice said pole pitch $2\tau_p$, said ferromagnetic winding carriers being positioned relative to said ferromagnetic return means so that the attraction forces developed between said winding carriers and said return means are opposed to the outer forces, and an electrodynamic guidance system having a support and guidance arrangement equipped with conductor loops for generating a flux having a low loss zone of zero flux value, said support and guidance arrangement also having a stabilization arrangement, said electrodynamic guidance system and said winding carrier assembly together with said return means being arranged relative to each other so as to cause the lift component of the forces developed between said carrier assembly and said return means to act to maintain said stabilization arrangement in said zone.

3,884,155

ARTICULATE RAILWAY VEHICLE STABILIZING LINKAGE APPARATUS

Max Maroshick, Glen Mills, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed June 17, 1974, Ser. No. 479,954

Int. Cl. B61d *17/14, 17/20;* **B61f** *3/12*

U.S. Cl. 105—4 R **10 Claims**

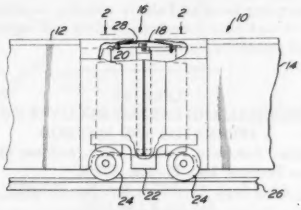
1. Linkage apparatus for stabilizing an articulated wheeled vehicle provided with a joint between a first and a second car

of the articulated vehicle with a support structure mounted between said cars, said linkage apparatus comprising:

a first linkage member pivotally connected to said support structure;

first and second laterally rigid arm means attached to said first and second cars, respectively;

a second linkage member being pivotally connected to said first linkage member at a first pivot point and to said first laterally rigid arm means at a second pivot point and



means connecting said second linkage member to said support structure for lateral movement with respect to said support structure; and

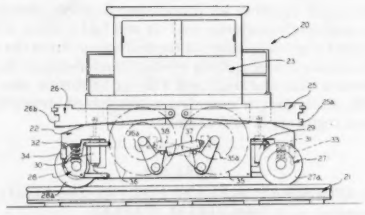
a third linkage member pivotally connected to said first linkage member at a third pivot point and to said laterally rigid arm means at a fourth pivot point and means connecting said third linkage member to said support structure for lateral movement with respect to said support structure.

3,884,156

AUTOMATICALLY TRACTION EFFORT CONTROLLED CONVERTIBLE RAIL-HIGHWAY TRACTOR

Victor H. Ames, and Marshall V. Hartelius, both of Midlothian, Ill., assignors to Whiting Corporation, Harvey, Ill.

Filed Jan. 28, 1974, Ser. No. 437,283
Int. Cl. B61c *13/00, 15/00;* **B61g** *5/00*
U.S. Cl. 105—75 **31 Claims**



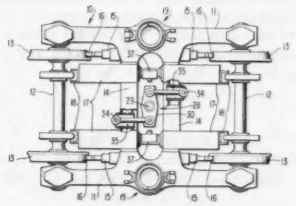
1. In a tractor having rail wheels for traveling on rails and for transporting rail cars, said tractor including a coupler for coupling the tractor to a rail car, and means for applying a weight transfer force between the coupler and the rail wheels to transfer a portion of the weight of a rail car connected to the tractor to the rail wheels thereof to increase the traction between the rail wheels and the rails, the improvement comprising: means controlling the weight transfer force applying means to automatically vary the value of the weight transfer force in response to the pulling or pushing traction needs of the tractor when the tractor is moving.

3,884,157

RAILWAY CAR BOGIE

André E. Pelabon, Paris, France, assignor to ANF-Frangeco S.A., Courbevoie, France

Filed Apr. 13, 1973, Ser. No. 350,804
Int. Cl. B61f *3/08, 5/20, 5/24*
U.S. Cl. 105—199 R **6 Claims**



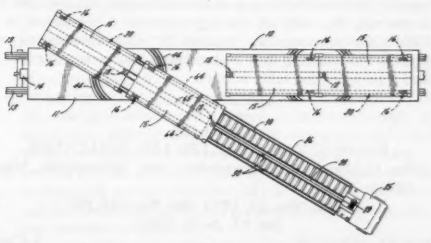
1. In a system for transmitting forces between a railway car and a bogie which supports said car, the combination including a rigid bogie frame means including a pair of side members and including means to rotatably support at least two pairs of track-engaging wheels, a vertical pivot element fixedly attached to and projecting downwardly from the underside of the car and located along the longitudinal centerline thereof, a horizontal transverse crossbar pivotally joined to said vertical pivot element at the midpoint of the crossbar to constrain longitudinal displacement of the bogie with respect to the car while permitting lateral and rotational displacement, the extremities of said crossbar being respectively pivotally connected to one end of each of a pair of force transmitting links disposed generally horizontally in the direction of movement of the bogie, the other ends of said links being respectively pivotally connected to said bogie frame means, and resilient means connected between said side members of the bogie frame means and said car to support the weight of the car and to limit said lateral and rotational displacement of the bogie with respect to the car, said crossbar and said force transmitting links being disposed generally in the horizontal plane of the rotational axes of said wheels.

3,884,158

RAILROAD CAR WITH HYDRAULICALLY ACTUATED TURNTABLE

James A. Rumell, 1955 Vermont, Blue Island, Ill. 61485

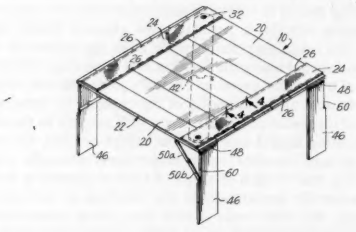
Filed Oct. 29, 1973, Ser. No. 410,345
Int. Cl. B65j *1/22*
U.S. Cl. 105—368 B **20 Claims**



1. A railroad transport vehicle comprising a flatbed, wheel means supporting said flatbed for movement on railroad tracks, a turntable mounted on said flatbed for relative pivotable movement about a pivot point, a container having support wheels and being longitudinally moveable on said turntable, said turntable having longitudinal guide tracks for receiving the wheels of said container and guiding movement of said container with respect to said turntable, selectively operable fluid cylinder means for rotating said turntable from a travel

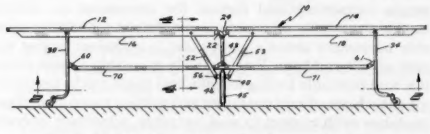
position in overlying relation with said flatbed to an unloading position at a sufficient angle with respect to said flatbed to permit said container to be moved off said turntable at the side of said flatbed, said fluid cylinder means including a cylinder mounted on said flatbed and a reciprocal cylinder rod associated with said cylinder, means connecting said cylinder rod to said turntable at a point radially spaced from said pivot point so that actuation of said cylinder causes said rod to exert a force on said turntable that is substantially tangential with respect to said pivot point, means for releasably locking opposite ends of said turntable to said flatbed when in said travel position, and means for releasably locking said container to said turntable.

3,884,159
FOLDING TABLE
Carmen V. Faria, 353 E. 83rd St., New York, N.Y. 10028
Filed Nov. 19, 1973, Ser. No. 416,988
Int. Cl. A47b *3/04*
U.S. Cl. 108—112 **3 Claims**



1. A folding table comprising an even-number of parallel slats adapted to collapse onto each other when the table is folded, said slats connected together by two transverse pieces of flexible material secured to the slats at the ends thereof by stitching, at least one diagonal cross-support for supporting the slats in a common plane to form a table top when the table is open, said diagonal cross-support including two connecting members of widths no greater than the width of one of the slats independently pivotally extending from two diagonal corners of the table top, means for coupling the connecting members together at substantially the center of the table top, foldable legs hingedly connected to the slats at the four corners of the table top, each of said legs of a width no greater than the width of one of the slats and of a length substantially equal to one-half the length of one of the slats, latch means for connecting the ends of the legs together when the table is folded, and hinge means connected between said slats and said legs for maintaining said legs substantially perpendicular to said slats when the table is open.

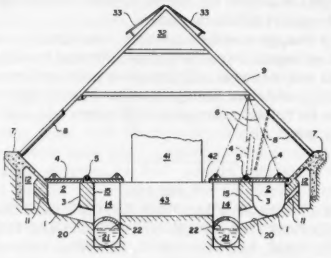
3,884,160
FOLDING TABLE CENTER LEG STRUCTURE
Julian Gutierrez, 6233 Brookview Ave., Minneapolis, Minn. 55424
Filed Nov. 23, 1973, Ser. No. 418,298
Int. Cl. A47b *3/091*
U.S. Cl. 108—113 **1 Claim**



1. A vertically foldable table having in combination

a pair of top plate members,
hinge means connecting the adjacent end portions of said plate members,
a single supporting leg extending from said hinge means centrally transversely of said table,
a pair of transversely spaced leg members adjacent each remote end portion of said plate members, said pairs of leg members each have a cross member therebetween,
rods respectively pivotally connecting said supporting leg with said last mentioned pairs of leg members rigidly holding said supporting leg member in operating position, a sleeve slidably disposed onto the lower portion of said suporting leg, and
links extending from said sleeve member to adjacent portions of said plate members, holding said supporting leg in rigid operating position.

3,884,161
WASTE DISPOSAL AND ENERGY RECOVERY REACTOR APPARATUS AND METHOD
Borge Richard Ankersen, Pontiac, Mich., assignor to Ankersen Resource Systems, Inc., Pontiac, Mich.
Filed Sept. 17, 1973, Ser. No. 397,829
Int. Cl. F23g *3/00*
U.S. Cl. 110—8 A **9 Claims**

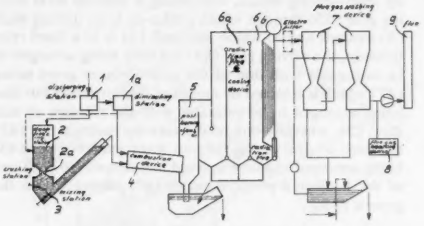


1. A waste disposal unit comprising an elongated generally horizontal reactor chamber, an exhaust stack connected to one end of said chamber, a plurality of openings into the top of said chamber, closure means on said openings selectively openable for charging said reactor, a multiplicity of tangential air injector nozzles at the bottom of said chamber for injecting high velocity air into said chamber and spaced fuel nozzle means in said chamber for introducing fluid fuel therein and means selectively operating said air and fuel nozzles to maintain a pilot combustion area at the end remote from the stack, an intermediate nonoxidizing pyrolysis area between the pilot combustion area and stack and a final combustion area adjacent the stack thereby providing a preselected atmosphere in selected segments of said chamber.

3,884,162
INCINERATOR PLANT FOR PRE-TREATED INDUSTRIAL WASTES
Ernst Schuster, Gummersbach, Germany, assignor to L. & C. Steinmüller GmbH, Gummersbach, Germany
Filed Jan. 21, 1974, Ser. No. 435,090
Claims priority, application Germany, Jan. 23, 1973, 2303117; Dec. 17, 1973, 2362691; Dec. 17, 1973, 2362690; Dec. 17, 1973, 2362689
Int. Cl. F23g *7/00*
U.S. Cl. 110—8 R **4 Claims**

1. An incinerator plant for burning industrial wastes delivered in containers, which includes a pre-treating section comprising: discharging means for discharging waste containing containers and their contents, comminuting means for comminuting the waste contents of said containers, deep-freezing

means adapted to receive and deep freeze wastes from said discharging and comminuting means; and a burning section which includes: a combustion device for receiving and burning the comminuted wastes, a post-burning device communicating with said combustion device for receiving therefrom wastes and further burning incompletely burned wastes, a flue gas cooling device following said post-burning device for receiving and cooling flue gas received from said post-burning device, a flue gas washing device following said flue gas cooling device for receiving flue gas from said flue gas cooling device and washing the thus obtained flue gas, and heating means with flue means for heating up the flue gas received from said flue gas washing device and releasing the washed flue gas through said flue means into the atmosphere.



3,884,163

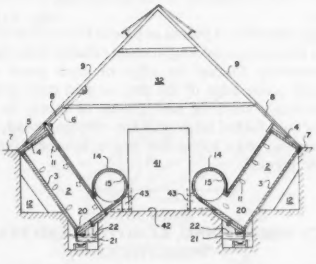
WASTE DISPOSAL AND ENERGY RECOVERY REACTOR APPARATUS AND METHOD

Borge Richard Ankersen, Pontiac, Mich., assignor to Ankersen Resource Systems, Inc., Pontiac, Mich.

Filed Sept. 17, 1973, Ser. No. 397,830

Int. Cl. F23g *5/12*

U.S. Cl. 110—10 **14 Claims**



1. A waste disposal unit comprising a plurality of generally vertical reactor chambers, connected at their bottom to a generally horizontal flue, a top opening in each chamber, closure means on said opening selectively openable for charging said reactors, a multiplicity of air injector nozzles adjacent the bottom of each said chamber for injecting high velocity air into each said chamber and spaced fuel nozzle means in each said chamber for introducing fluid fuel therein and means selectively operating said air and fuel nozzles to maintain first a drying atmosphere in said chamber until moisture is removed from waste charged into the chamber, then a high temperature, non-oxidizing atmosphere until the waste is substantially entirely pyrolized and then a high temperature tangentially non-oxidizing atmosphere to consume the pyrolized waste in said chamber.

3,884,164

CLOTH-PRESSER MECHANISM IN A SEWING MACHINE

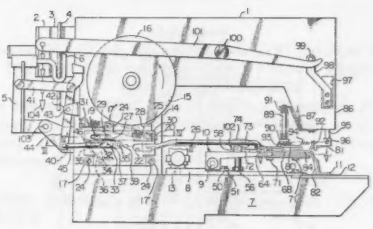
Shirozi Nakamura, Tokyo, Japan, assignor to Tokyo Juki Kobyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1967, Ser. No. 662,495

Claims priority, application Japan, Sept. 10, 1966, 41-59715

Int. Cl. D05b *3/06*

U.S. Cl. 112—70 **1 Claim**



1. A work clamp mechanism for use in a sewing machine having a bed for bar stitching a button-hole at an end thereof, comprising:

a vibrating plate (**8**) positioned on the bed (**7**) of the sewing machine and adapted to vibrate as required for bar stitching;

a work holder (**10**) pivotally mounted on said vibrating plate (**8**) by a horizontally disposed pivot axis (**9**);

a pair of work clamps (**11, 11'**) having clamp portions at the ends thereof and base portions pivotally supported on said work holder (**10**), the clamp portions adapted to reciprocatively move and being symmetrically positioned with respect to a button hole slit line;

a cam plate (**70**) adapted to control the movement of said work clamps and movably mounted on said work holder for movement between a first position for opening said clamp portions, and a second position for closing said clamp portions;

a first release member (**74**) operatively positioned to normally anchor said cam plate (**70**) in its second position and to release the cam plate from its second position when said work holder pivots upwardly from said vibrating plate;

a first spring (**94**) operatively disposed to accumulate energy produced by the movement of said cam plate towards its second position and to cause said cam plate to shift from its second position to its first position by means of the accumulated energy, in connection with the release of said cam plate (**70**) by said first release-member (**74**);

a rotary cam (**16**) interlocked with a main drive shaft of the sewing machine;

a control member (**28**) disposed on a side of an arm (**1**) of the sewing machine and adapted to move forwardly in assoication with the rotation of said rotary cam (**16**) and to move rearwardly independently of said rotary cam;

a second release member (**34**) operatively positioned to anchor said control member (**28**) in its forward position and to release the anchored control member as the sewing machine is started;

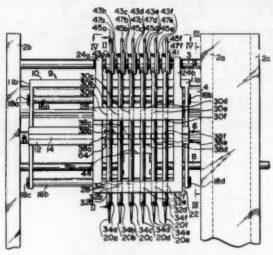
a second spring (**31**) operatively disposed to accumulate energy due to the forward movement of said control member and to permit said control member (**28**) to move rearwardly due to the accumulated energy developed in connection with the release of said second release member (**34**); and

means (**26**) connecting said control member (**28**) to said cam plate (**70**) for moving said cam plate towards its second position in accordance with the rearward movement of said control member (**28**).

3,884,165
NEEDLE-BAR AND TAKE-UP LEVER SELECTION APPARATUS FOR EMBROIDERY MACHINE

Ikuo Tajima, No. 44-10 Chokyuji-machi, Higashi-ku, Nagoya, Japan

Filed Nov. 13, 1973, Ser. No. 415,401
Claims priority, application Japan, May 18, 1973, 48-54556; May 18, 1973, 48-54557
Int. Cl. D05c *3/04*
U.S. Cl. 112—83 **3 Claims**



1. In a multiple needle-bar and take-up lever embroidery machine supported by a support bar and frame stands, an apparatus comprising:

a needle-bar case (**22**) positioned on a needle-bar case frame (**9**), comprising the following members;

a. a frame structure consisting of two vertical frames (24*a*, **24***b*) and two lateral frames (**26, 28**),

b. two pairs of projected arms (**40***a*, **40***b*) (**40***c*, **40***d*) through which lateral bars (**16***a*, **16***b*) extend respectively, said projected arms being slidable in relation to said lateral bars respectively,

c. a plurality of projections series (**36**) of needle-bar clamps series (**38**) which are respectively attached to needle-bars series (**34**) which can slide upward and downward respectively through holes series (**30**) positioned in said lateral frame (**26**) and holes series (**32**) positioned in the lateral frame (**28**), said projection series being slidable within a groove (**14**) positioned in a central frame (**12**),

d. a needle-bar case slide bar (**8**) attached to a projection (**44**) by the media of a bracket (**48**) with a bolt (**52**) and fasteners (**46***a*, **46***b*),

e. a plurality of needles series (**20**) attached to the needle-bar series (**34**);

a structure of take-up levers, comprising a take-up lever guide bar (**41**) which are arranged between two projection arms (**39***a*, **39***b*) and which are extending through equally spaced take-up lever guides series (**43**) which comprises take-up lever gears series (**47**), take-up levers series (**45**) provided with projected portions series (**49**) which are slidable within either a lateral groove (**51**) or a groove (**55**) positioned in a base (**56**) respectively;

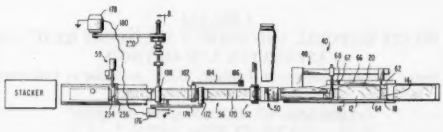
a motor and cam driving means, comprising a motor (**88**) having a motor gear (**90**) which starts operation in connection with electrical contact devices including microswitches series (**82**) and silver paper contacts series (**86**) positioned on a punched Jacquard card (**84**), the motor gear (**90**) being in mesh with a cam gear (**92**) mounted on a cam shaft (**72**), and a slide cam (**76**) which is also mounted on the cam shaft (**72**) and has a cam groove (74) within which a roller (**80**) of a cam driver (**78**) mounted on the needle-bar case slide bar (**8**) is slidably positioned;

a needle-bar driving means, comprising a needle-bar driver (**54**) extending through and in fixed relationship to a clamp (**62**) provided with a groove (**60**) and being arranged movable upward and downward through bushings (**58***a*, **58***b*) by means of a needle-bar driver crank (**68**) in operation with the rotation of a needle-bar driver shaft (**6**), and a groove (**64**) positioned in the central frame (12) behind of which the needle-bar driver (**54**) is positioned with its groove (**60**) being in a position ready to be engaged with one of the projections series (**36**) of the needle-bar clamps series (**38**), whenever a preselected needle-bar is positioned at the groove (**64**); and a take-up lever driving means, comprising a take-up lever driving gear (**53**) through which a take-up lever driving shaft (**3**) extends and to which the shaft (**3**) is in a fixed relationship, the driving gear (**53**) not only being arranged to be engagable with one of the take-up lever gears series (**47**) which is selected by means of this invention but also being arranged to be rotatable with the rotation of said shaft (**3**), whereby one of the take-up levers series (**45**) attahced to one of the take-up lever guides series (**43**) being arranged to move upward and downward with one of the projected portions series (**49**) sliding within the groove (**55**).

3,884,166
METHOD FOR MAKING SHIRT CUFFS

Elwood Rinehimer, Wapwallopen; Donald M. Walters, Lehighton, and Kenneth L. Jarrett, Sr., Mertztown, all of Pa., assignors to Eagle Shirtmakers, Inc., Quakertown, Pa.

Filed May 7, 1973, Ser. No. 357,827
Int. Cl. D05b *19/00*
U.S. Cl. 112—121.29 **34 Claims**



1. A method of stitching fabric to an unbroken strip of material comprising, the steps of continuously feeding an unbroken strip of material to a continuously operating stitching head;

placing a plurality of pieces of precut fabric onto the continuous strip in spaced longitudinal relation with each other; successively folding on edge of each piece of fabric around a side edge of the strip as said strip advances;

longitudinally stitching said pieces of fabric to the strip along said folded edge with the stitching head; and

severing the strip along the space between the stitched fabric pieces.

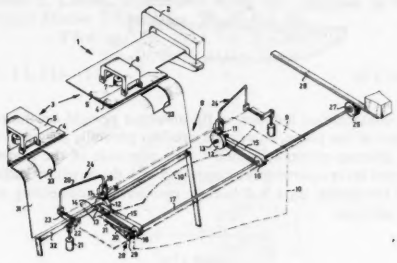
3,884,167
DEVICE FOR FEEDING, REMOVING AND STACKING WORKPIECES

Horst Bernewasser, Steinhagen, and Hans Scholl, Lipperreihe, both of Germany, assignors to Kochs Adler AG, Bielefield, Germany

Filed Nov. 28, 1973, Ser. No. 419,690
Claims priority, application Germany, Nov. 29, 1972, 2258430
Int. Cl.[2] D05B *33/00*
U.S. Cl. 112—121.29 **4 Claims**

1. In combination with a sewing device having a sewing machine and workpiece clamping means, means for feeding flexible workpieces into said workpiece clamping means and removing the same after sewing, comprising a workpiece supporting plate means for moving said workpiece support plate in the direction to and from said workpiece supporting plate, said swingable holding means for clamping a workpiece during moving to said workpiece clamping means and releasing and displacing of said workpiece from said workpiece support plate during the removing of the same in an opposite

direction, and stacking means including an oscilatable stacking rod for stacking means for oscillating said stacking rod in timed relationship to the releasing of said workpiece clamping means and said workpiece holding means, and said workpiece wherein said workpiece supporting plate is provided with recesses and said workpiece holding means comprises feed rollers pivoted below said workpiece supporting plate and penetrating said recesses, rotary pressure rollers arranged



above said workpiece holding means and cooperating with said feed rollers, lifting and pressing means attached to said workpiece supporting plate for pressing said rotary presser roller against said feed rollers, and driving means for said feed rollers, said feed rollers being non-rotatable when moving said workpiece supporting plate in a direction to said workpiece clamping means of said sewing device and being rotatable when moved in a contrary direction.

3,884,168

METHOD OF MAKING SLIDE-FASTENER HALVES

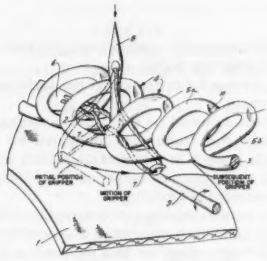
Helmut Heimberger, Grenzach, Germany, assignor to Opti-Holding AG, Glarus, Switzerland

Filed July 23, 1973, Ser. No. 381,441

Claims priority, application Germany, July 21, 1972, 2235828

Int. Cl. A44b *19/12, 19/34*

U.S. Cl. 112—265 **4 Claims**



1. A method of making a slide-fastener stringer half comprising the steps of:

a. feeding a support tape and a continuous synthetic-resin monofilament preformed with a succession of turns each having a pair of shanks joined together at a coupling head to a sewing station so that shanks of successive turns come to lie on said tape;

b. passing a first thread loop through said tape between a pair of shanks of successive turns at said sewing station;

c. drawing said loop over one of the latter shanks;

d. thereafter swinging said loop laterally under a shank of the next turn between said shank of the next turn and said tape;

e. passing a second loop of thread through said tape between said one of said shanks and said next shank and through the first loop;

f. passing said second loop over said next shank and thereafter swinging said second loop laterally and under a third shank of a further turn; and

g. repeating steps (b) - (f) for the succeeding turns of said filament while advancing same and said tape through said station.

3,884,169

MARGINAL ZONE REINFORCING SYSTEM FOR THE PRODUCTION OF HEAVY DUTY FOAM RESIN CONSTRUCTIONS

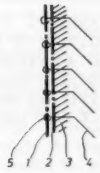
Peter Hoppe, Troisdorf; Gustav Drouven, Bensberg; Helmut Leyer, Opladen, and Johann Müller, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed July 13, 1972, Ser. No. 271,222

Claims priority, application Germany, July 13, 1971, 21348538

Int. Cl. B32b *7/08;* **B29d** *3/02*

U.S. Cl. 112—420 **9 Claims**



1. In a construction comprising a foam layer having an outer skin and a marginal zone reinforcing system bonded to the foam layer and disposed inwardly of said outer skin; the improvement which comprises, as the reinforcing system, a single multi-layer carpet consisting of

a. a layer consisting of at least one material selected from the group consisting of mats and webs, positioned adjacent said outer skin;

b. a layer consisting of a fiber fleece of fine fibers, positioned adjacent layer (a); and

c. a layer consisting of a fiber fleece of coarse fibers positioned adjacent layer (b) and said foam core;

said layers (a), (b), and (c) being secured together by threads, the density of said layers (a), (b), and (c) decreasing from layer (a) to layer (b) to layer (c) of said carpet whereby improved strength characteristics are imparted to said construction.

3,884,170

CONTROL SYSTEM FOR TORPEDOES

Harvey M. Jensen, State College, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

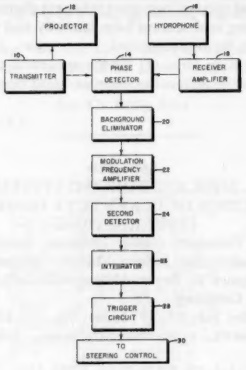
Filed Feb. 26, 1960, Ser. No. 11,384

Int. Cl. F42b *19/10, 19/01, 19/06*

U.S. Cl. 114—20 R **6 Claims**

1. In a detection system, the combination comprising: transmitter means capable of driving a projector with a continuous-acoustic signal, receiver means adapted to receive said signal transmitted by said transmitter; phase detection means capable of detecting the phase difference between said continuous

transmitted signal and said received signal, and trigger means adapted to respond to phase differences produced by the



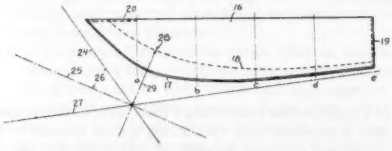
characteristics of medium between said transmitter means and said receiver means.

3,884,171

BOAT HULL WITH A BOTTOM OF A PORTION OF THE SURFACE OF A HYPERBOLOID

John P. Kline, P.O. Box 100, East Hampton, N.Y. 11937

Filed June 1, 1973, Ser. No. 365,828
Int. Cl. B63b *1/04*
U.S. Cl. 114—62 **22 Claims**



1. A boat hull comprising at least a bow, spaced sides, a bottom secured at least to the sides, a transom, and a keel line extending longitudinally and centrally of the bottom; each side having a bottom edge forming chines which are parallel or essentially parallel to each other, the bottom extending between the chines and between the bow and the transom, the bottom for at least a substantial portion of the length thereof from the bow being a double ruled surface having a gorge or saddle with a dimension and an axis, the double ruled surface being of crossed straight lines having a control angle between about **20** to **60** degrees, the chines being spaced apart a distance within the dimension of the gorge or saddle, and the axis of the gorge or saddle being located at or forwardly of the longitudinal center of the hull, and each chine and the keel line being a bola curve for the length of the double ruled surface.

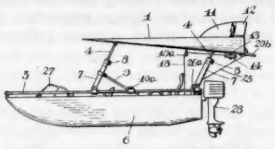
3,884,172

HYDROPLANE BOAT

Kenryu Takahashi, 3-go, 22-ban, 1-chome, Higashitateishi, Tokyo, Japan

Filed Jan. 2, 1974, Ser. No. 429,592
Int. Cl. B63b *1/18*
U.S. Cl. 114—66.5 R **4 Claims**

1. An improved hydroplane boat comprising a triangular swelling plane above the hull, the plane sloping gently first upwardly from a center chord, symmetrically to a right and left span, and then downwardly at each span, and said plane having an apex angle directed toward the bow of the boat, a center rod being situated along the center chord beneath the plane, two branch rods projecting from the center rod, a handrail mounted on a qunwale, four rods connected with the branch rods and the handrail to slide therealong and be set at



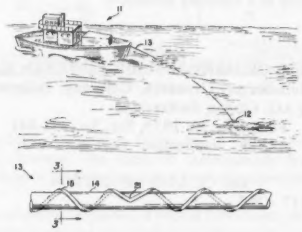
a predetermined location, a fin mounted upright on the rear center of the plane, an auxiliary rudder pivotally joined to the fin, ailerons pivotally joined to the rear side of the plane, a control lever operatively connecting with the auxiliary rudder, and footpedals on a hull-bottom operatively connecting with the ailerons.

3,884,173

SUPPRESSION OF CABLE STRUMMING VIBRATION BY A RIDGED CABLE JACKET

Andrew G. Fabula, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 12, 1974, Ser. No. 487,832
Int. Cl. B63b *21/56;* **H01b** *7/04;* **H02g** *7/14*
U.S. Cl. 114—235 F **20 Claims**



1. In an oceanographic system for deployment in an ocean environment which includes:

a surface station for operation at the surface of the ocean environment,

winch means mounted on said surface station,

an oceanographic transducer configured for remote location with respect to said surface station and for towing beneath the surface of said ocean environment,

the improvement comprising:

a flexible, antistrumming, oceanographic cable connected between said winch means and said oceanographic transducer for controlling the relative position therebetween, said flexible antistrumming, oceanographic cable including;

a central, strain-carrying means for transmission of tensional loads along the longitudinal axis of said flexible, antistrumming, oceanographic cable,

an essentially smooth, external covering means surrounding said central strain-carrying means and effectively joined thereto for protecting said central strain-carrying means and for facilitating reeving and handling of the oceanographic cable by said winch means, and

a spoiler means effectively attached to said essentially smooth, external covering means and extending radially outward therefrom between 15 and 35 percent of the diameter of the oceanographic cable and spirally

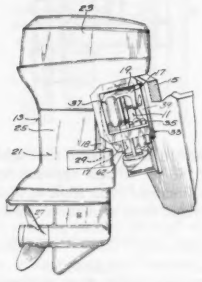
disposed with a pitch which reverses itself in direction at predetermined intervals along the length thereof for modifying the cross-flow of fluids about the external surface of said flexible, antistrumming oceanographic cable.

3,884,174

MARINE NOISE AND VIBRATION ISOLATION SYSTEM

Robert T. Larsen, Menomonee Falls, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 15, 1973, Ser. No. 388,374
Int. Cl. B63h *21/26, 21/30*
U.S. Cl. 115—17 **19 Claims**



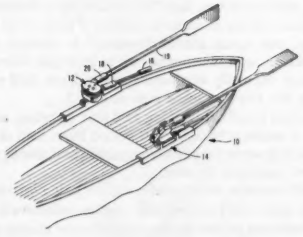
1. An outboard motor mounting arrangement comprising a mounting bracket adapted to be secured to the transom of a boat and including a lower surface and an upper surface located in rearwardly spaced relation from and above said lower surface, an intermediate bracket located between said upper and lower surfaces of said mounting bracket and including an upper surface located in spaced facing relation to said upper surface of said mounting bracket and a lower surface in spaced facing relation to said lower surface of said mounting bracket, first and second discrete and laterally spaced noise and vibration isolating means extending between said spaced upper surfaces, and a third discrete noise and vibration isolating means extending between said spaced lower surfaces.

3,884,175

OAR REVERSING DEVICE

George D. Bellis, 2431 E. Taft, Orange, Calif. 92665

Filed May 31, 1973, Ser. No. 365,770
Int. Cl. B63h *16/00*
U.S. Cl. 115—24.3 **7 Claims**



1. A novel oar reversing arrangement comprising:
a handle portion,
a paddle portion,
an oar reversing device connecting said portions and including a housing and a pair of meshing gears received in said housing which are in a different plane from the movement of said portions, one portion and one gear rigidly fixed to one another for rotating about a first stationary common shaft, the end of said portion and said gear being superposed along the axis of said first stationary common shaft and the shaft passing through said end of said portion and said gear, and the other portion and other gear rotate rigidly fixed to one another for rotating axially about a second stationary common shaft, the end of said other portion and said other gear being superposed along the axis of said second stationary common shaft and said second shaft passing through said end of said other portion and said other gear, said pair of gears being essentially enclosed in said housing to prevent contact thereby by exterior objects, and a pair of rigid, spaced-apart posts which maintain the distance between the plane of the gears and the plane of movement of said portions.

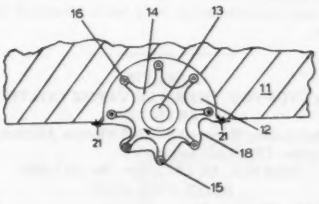
7. A novel oar lock assembly comprising: an oar reversing arrangement having an underside, said arrangement including a pair of meshing gears, a channel member having a top side, and lengthwise sides, a length of the gunwhale of a boat being adapted to be snuggly and slidably received within said channel member between said lengthwise sides,
fixed and rigid means on the underside of said oar reversing arrangement and complementary fixed and rigid means on the top of said channel member,
said means rigidly attached to the underside of said oar reversing arrangement comprising two projections having key-shaped slots, and the complementary means rigidly attached to the top of said channel member comprises a cross-bar having flattened sides and held by two uprights at each of its ends, said cross-bar being slidable into and out of said projections when said oar reversing arrangement is rotated to the said channel member but not otherwise, whereby said means may be interlocked by the relative rotation of the oar reversing arrangement around an axis represented by the lengthwise dimension of the channel member so that the two fixed and rigid means may be separated when the oar reversing arrangement mechanism including said pair of gears is rotated to the side of the channel member, but said two means are interlocked when said oar reversing arrangement mechanism is rotated to a position above said channel member.

3,884,176

PROPULSIVE FORCE GENERATING MEANS FOR MARINE VEHICLES

Lavis Albert Henry Riddle, East Cowes, England, assignor to British Hovercraft Corporation Limited, Yeovil, England

Filed June 25, 1974, Ser. No. 483,079
Claims priority, application United Kingdom, June 25, 1973, 30017/73
Int. Cl. B63h *1/04*
U.S. Cl. 115—49 **5 Claims**



1. In or for a marine vehicle, propulsive force generating means including a plurality of longitudinally extending parallel rollers evenly spaced from and around a common axis and in operation of the device being arranged to rotate around the common axis so as to prescribe a path of movement which is partly within a space formed in the underside of a vehicle to which the device is attached, a sheet of flexible impermeable

material arranged for attachment on the underside of the vehicle so as to extend across the space and having a longer length between lines of attachment on the underside of the vehicle than the length of that part of the path of movement of the rollers which is external of the space in the underside of the vehicle, and means arranged for co-operation with each end of the device and with the vehicle for preventing entry of water to the interior of the device.

3,884,177

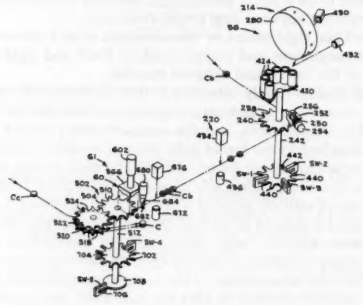
CAPSULE ASSEMBLY MACHINE

Edwin H. Brink, 1748 Marlyn Way, San Jose, Calif. 95125, and Robert K. Houston, 3396 Mauricia Ave., Santa Clara, Calif. 95051

Division of Ser. No. 244,484, April 17, 1972, Pat. No. 3,797,195. This application Nov. 5, 1973, Ser. No. 413,088

Int. Cl. B05c *11/00*

U.S. Cl. 118—2 **5 Claims**



1. Apparatus for applying adhesive to capsule discs comprising a conveyor for a row of the discs, a rotating star wheel having pockets for receiving the discs from said row, an adhesive dispenser above one of said star wheel pockets and timed to deposit adhesive on each underlying disc, a movable stop positioned at said conveyor for leaving a predetermined number of the discs between the stop and said adhesive dispenser, a capsule disc detector just upstream of said stop, and control means connected between said detector and said adhesive dispenser, said control means including count-producing means activated when said disc detector determines that an empty space rather than a disc is positioned just upstream of said stop, the activated count-producing means then counting off said predetermined number of discs between said stop and said dispenser position, said control means interposing said stop when no capsule disc is present just upstream of said stop, said control means thereafter interrupting dispenser operation after said predetermined number of capsule discs between said stop and said dispenser have been advanced under the dispenser.

3,884,178

APPARATUS FOR THERMAL VAPOR COATING AN ARTICLE

Herwig Reinholder Horn, and Adolf Florian Aldrian, both of Steyrergasse 17, Graz, Austria

Filed Nov. 19, 1973, Ser. No. 417,408

Int. Cl. C23c *13/08*

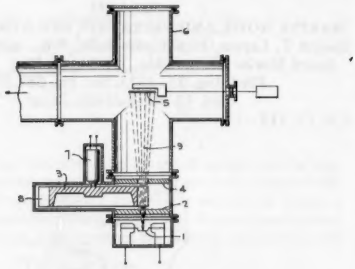
U.S. Cl. 118—49 **4 Claims**

1. Apparatus for thermal vapor coating an article, comprising:

a vaporization source for generating jets of steam including the coating substance;

a vacuum chamber for mounting said article; and

means mounted between said vacuum chamber and said source for directing said vapor to said article, said means including a rotating disc having a number of channels along its periphery, said channels being inclined with respect to the longitudinal axis of said disc and said disc



being mounted to rotate so that said channels are positioned in the jet stream between said source and said article and inclined at an angle to block the direct path of said jet stream from said source to said article.

3,884,179

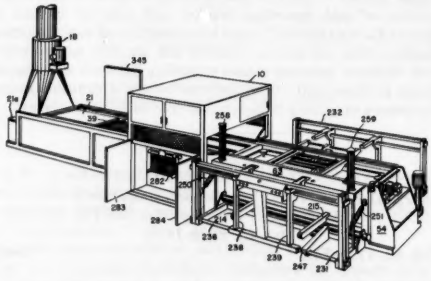
AUTOMATIC SPRAY-PAINTING MACHINE

Harry Szczepanski, 960 Clancy, N.E., Grand Rapids, Mich. 49503

Division of Ser. No. 79,012, Oct. 8, 1970, Pat. No. 3,716,022. This application Feb. 7, 1973, Ser. No. 330,198

Int. Cl. B05c *5/00, 11/16*

U.S. Cl. 118—70 **3 Claims**



1. A spray-painting machine including a housing structure, ventilation means adapted to induce a flow of air through said housing, and spray means mounted to project spray within said housing, said housing having at least one side opening into the space normally containing spray from said spray means, wherein the improvement comprises:

conveyor means traversing said side opening, and extending to a position laterally displaced from said side opening;

work-supporting means engageable and disengageable from said conveyor means;

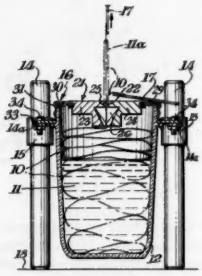
transfer means, said transfer means being operative to transfer said work-supporting means selectively in opposite directions to and from said conveyor means in a direction transverse thereto; and

solvent washing means disposed below said conveyor means, and also including elevator means operative to raise and lower said work-supporting means from said transfer means, said transfer means additionally including a lower portion adapted to move said work-supporting means to and from said solvent washing means.

3,884,180
COATING APPARATUS

Ford H. McBerty, R.D. 3, Box 243, Oxford, Pa. 19363

Filed Oct. 16, 1972, Ser. No. 297,669
Int. Cl. B05c 11/02
U.S. Cl. 118—122 5 Claims

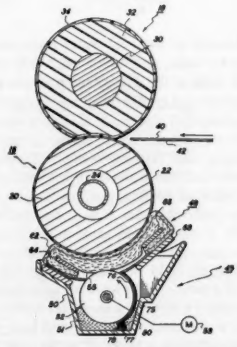


1. A device for use in coating a liquid material on a film or tape which device comprises a container for said liquid; disposed within the upper section of said container and above the level of any liquid therein a means for temporarily accumulating any liquid as it is being passed through said means, said means having a configuration and depth defined by at least two coacting plates spaced apart and forming two orifices in conduit relationship with each other, one orifice being an outlet from said device for said film or tape and liquid thereon and the other orifice being adapted to receive liquid and said film and tape first but having a slot width larger than that of said outlet orifice, the differential in said orifice sizes thereby effecting said accumulation and effecting turbulence of the accumulated liquid to thereby enhance said coating; and in combination with said device, an invertible support for said container affording inversion of said container.

3,884,181
CAPILLARY BAFFLE-CONSTANT OIL HEIGHT INDEPENDENT OF OIL LEVEL

Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1973, Ser. No. 427,750
Int. Cl. B05c 11/105
U.S. Cl. 118—261 8 Claims



1. Apparatus for fusing toner images to a substrate by heat and pressure, said apparatus comprising:

a heated fuser member for softening said toner images;

a backup member forming a nip with said heated member through which said substrate moves with said toner images contacting said heated fuser member;

a sump containing a quantity of offset-preventing liquid;

means contacting said heated fuser member for metering a thin coating of offset-preventing liquid thereto;

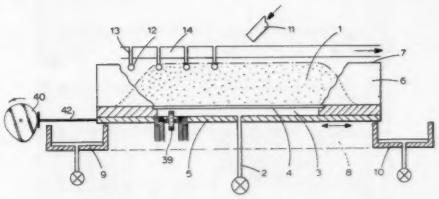
applicator means adapted to contact said offset-preventing liquid and conveying it to said means contacting said heated fuser member; and

means for conveying offset-preventing liquid from said sump to the surface of said applicator means at points remote from said sump of offset-preventing liquid, said conveying means comprising means cooperating with said applicator means to form a capillary therewith, said liquid being conveyed to said applicator at points intermediate said means contacting said fuser member and said sump, said conveying means being impervious to said offset preventing liquid.

3,884,182
FLUIDISED BED APPARATUS

Peter Charles Jones, 66 Pinewood Ave., Weybridge, England

Filed June 7, 1974, Ser. No. 477,349
Claims priority, application United Kingdom, Apr. 23, 1974, 17668/74
Int. Cl. B05c 7/14
U.S. Cl. 118—308 11 Claims

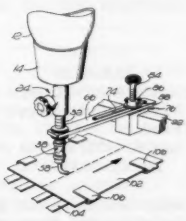


1. An apparatus for forming a fluidised bed, which comprises a base arranged to receive powder; a filter extending across part of the base but not across at least two base portions at opposite ends of the base, thereby to define a plenum chamber; a gas inlet leading into the plenum chamber; and means for supplying powder on to the base whereby a fluidised bed is formed over the filter and unfluidised powder accumulates above the said at least two base portions thereby to retain the fluidised powder against movement out of the fluidised bed.

3,884,183
LIQUID DISPENSING SYSTEM

Ralph D. Sprung, Jr., 707 N. Conlan Ave., West Covina, Calif. 91790

Filed Nov. 26, 1973, Ser. No. 419,016
Int. Cl. B05c 11/02
U.S. Cl. 118—324 4 Claims



1. A liquid dispensing system for depsoiting liquid along the line of a paper transported by a conveyor means for subsequent ease in folding said paper along said line comprising:

conduit means having an outlet orifice positioned adjacent and spaced from said paper for depositing a fine line of said liquid on said paper;

a liquid reservoir for holding a supply of said liquid;

valve means for controlling the flow of said liquid to said outlet orifice;

means for adjusting the vertical and longitudinal position of said orifice with respect to said paper, wherein said conduit is secured to a mounting bracket said bracket being fixed to a mounting member, said mounting member supporting said longitudinal adjusting means and said bracket supporting said vertical adjusting means.

3,884,184

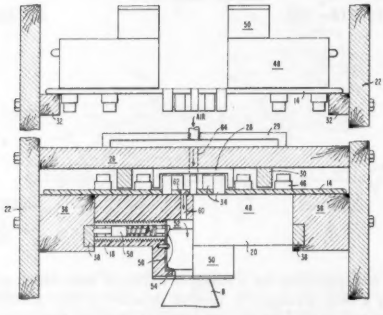
GLASSWARE TRANSFER AND COATING APPARATUS

Roy S. Arrandale, Elmira; James H. Cady, Horseheads, and Leroy C. Hartman, Elmira, all of N.Y., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed July 24, 1972, Ser. No. 274,705

Int. Cl. B05b *5/02*

U.S. Cl. 118—630 **12 Claims**



1. A high-speed conveyor and chucking arrangement adapted to releasably hold and transfer articles from a first to a second location and comprising:

a movably mounted conveyor flight extending between said first and second locations and including a plurality of interconnected links;

a plurality of spaced-apart chuck assemblies positioned along said conveyor flight for movement therewith,

each said assembly including a pair of mating elements mounted on selected ones of said links;

said mating elements defining therebetween a cavity adapted to receive and grasp a said article;

each of said elements being mounted for movement relative to said selected one of the links for article engagement and disengagement;

means to effect said movement; and

means, including channel means within each said chuck assembly, to fluid purge each said cavity during article transfer.

3,884,185

COATED WIRE DEVELOPER BRUSH

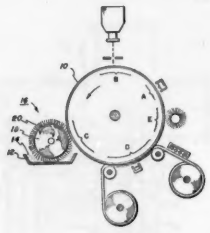
Alan J. Liebman, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 6, 1973, Ser. No. 394,951

Int. Cl. G03g *13/00*

U.S. Cl. 118—637 **10 Claims**

1. A developer brush for applying toner particles to electrostatic latent images carried by a photoconductively coated member of an electrostatic processor, said brush comprising: a support member, and a plurality of conductive flexible metal threads extending outwardly from said support member to form bristles; each of said threads having a coating of insulating material extending along its length to at least the outer tip thereof; said insulating material being triboelectrically displaced from said toner particles, whereby toner particles tend



to be attracted to and held on said bristles by a triboelectric charging process; and means for connecting said threads to a source of electrical potential, thereby enabling said bristles to function as development electrodes.

3,884,186

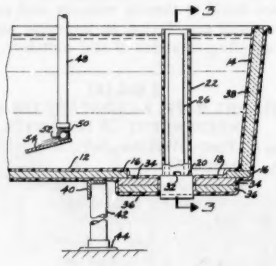
TANK, FILTER AND DEPROTEINATOR FOR MARINE LIFE

William P. Hickey, 7585 Nottingham Dr., Lambertville, Mich. 48144

Continuation of Ser. No. 162,855, July 15, 1971, Pat. No. 3,760,767. This application May 18, 1973, Ser. No. 361,470

Int. Cl. A01k *63/00*

U.S. Cl. 119—3 **7 Claims**

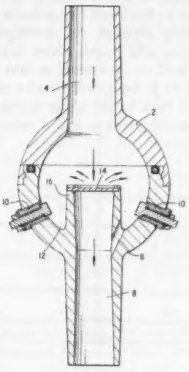


1. A tank having an internal water recirulation path that is uninterrupted by walls, and which path fish can traverse continuously, said tank at the same time providing for continuous water purification and comprising: a generally flat bottom and a generally cylindrical side wall; said side walls being slightly conically tapered with the small diameter portion being adjacent the bottom, said bottom being stiffened with plywood, and the bottom and side walls having a smooth inside layer of glass fiber reinforced plastic; a sump in said bottom adjacent said generally cylindrical side wall, a conduit means for taking suction on the water in said tank and having an inlet positioned in said tank spaced circumferentially to one side of said sump and adjacent said bottom; said conduit means being constructed and arranged to have an inlet facing said sump to induce a circulatory flow of water over said sump but permitting the main recirculation path in said tank to pass thereby; and means introducing a layer of water into said tank in the direction of said recirculation path for adding energy to said recirculation path to keep the water in said tank recirculating; said means including structure for spreading said water into a layer having sufficient cross section that its velocity when united with said recirculation path does not produce turbulence which holds fesces suspended off of said bottom.

3,884,187
MASTITIS DETECTOR

Kenneth Herbert Massie, and Gordon Alfred Chalton, both of Bromborough, England, assignors to Chalton Electronic Services Limited, Flintshires, North Wales, Great Britain

Filed Sept. 21, 1973, Ser. No. 399,613
Int. Cl. A01j *7/00*
U.S. Cl. 119—14.14 **17 Claims**

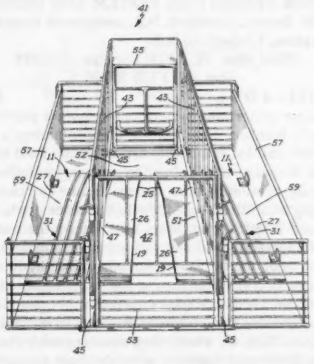


1. Milk conductivity indicating apparatus comprising a conductivity cell having two electrodes between which the milk is adapted to be passed during milking, means for supplying electric current to said cell, said current being attenuated in said cell to a greater or lesser extent according to the lesser or greater conductivity of the milk between said electrodes, trigger means responsive to the attenuation of said current so as to fire when the milk conductivity exceeds a predetermined value, indicating means for indicating response of said trigger means, and a curcuit for preventing activation of the trigger means in response to signals indicative of the conductivity of the fore milk passing through the cell.

3,884,188
PIGLET KNEE PROTECTOR

David J. Arends, R.R. No. 3, Luverne, Minn. 56156

Filed Mar. 17, 1972, Ser. No. 235,499
Int. Cl. A01k *1/02*
U.S. Cl. 119—20 **4 Claims**



1. In a farrowing crate having a sow containing portion, a piglet containing portion on a side of said sow containing portion, and an open space between said piglet containing portion and said sow containing portion for piglets to reach the udder of a sow, an improved floor for said farrowing crate, comprising:

a. a first portion having a smooth surface located primarily within said sow containing portion of said farrowing crate, said portion having a predetermined length sufficient to extend longitudinally along the udder of said sow and extending transversely a predetermined distance;

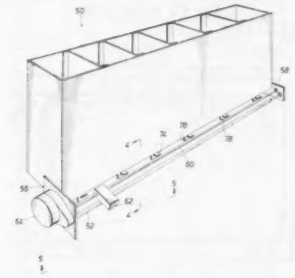
b. a second portion having a rough surface located primarily within said piglet containing portion, said second portion extending longitudinally along said first portion and extending transversely a predetermined distance; and

c. said second portion extending transversely a predetermined distance for allowing piglets to brace their hind feet thereon and said first portion extending transversely a predetermined distance such that when said piglets have braced their hind feet on said second portion, said piglet's front knees will slip upon said smooth surface of said first portion when said piglets are nursing.

3,884,189
MULTIPLE COMPARTMENT ANIMAL FEEDER

Arthur P. Ruth, P.O. Box 11037, Houston, Tex.

Filed July 13, 1973, Ser. No. 378,955
Int. Cl. A01k *05/02*
U.S. Cl. 119—51.13 **8 Claims**



1. An animal feeder having a multiplicity of compartments for dispensing animal feed to an animal over a series of timed intervals which comprises:

a storage container divided into at least two compartments by partitions, said storage container being adapted to receive and store food placed therein and further including a hinged door at the bottom of each compartment;

latch means for holding the door at each compartment in a closed position;

a lead screw operatively arranged adjacent to said storage container;

a travelling nut threadedly engaged with said lead screw;

a projecting means associated with each door and operatively arranged relative to said latch means for opening said door; and,

motive means for operating said lead screw.

3,884,190
RESILIENTLY EXTENSIBLE, COILED LEASH

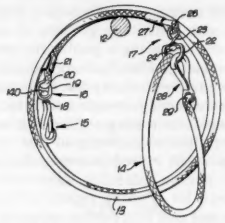
Richard B. Gurrey, Long Beach, Calif., assignor to Richard B. Gurrey and Hartley B. Gurrey, both of Palm Desert, Calif.

Filed Mar. 25, 1974, Ser. No. 454,404
Int. Cl. A01k *27/00*
U.S. Cl. 119—109 **7 Claims**

1. In an extensible leash assembly,

a. a metallic wire which normally in untensioned state and throughout its length forms side-by-side coils at least about 5 inches in diameter, the wire also having an uncoiled, extended state when subjected to tensioning force application, the leash in fully extended state being less than about 60 inches in length,

b. a sheath on the wire and characterized as sufficiently flexible so as not to inhibit formation of said coils, and



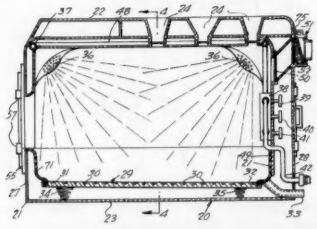
c. a handle at one end of the leash, and a catch at the opposite end of the leash, a swivel connection between said catch and the wire at said opposite end of the leash, and another swivel connection between said handle and the wire at said one end of the leash.

3,884,191

ANIMAL BATHING AND DRYING APPARATUS

Pansy M. Stout, 206 Christine Dr., Sacramento, Calif. 95815

Filed Feb. 21, 1974, Ser. No. 444,369
Int. Cl. A01k *13/00*
U.S. Cl. 119—158 **3 Claims**



1. In an animal bathing and drying apparatus, an outer housing including a top section, a horizontally disposed bottom wall and spaced parallel vertically disposed side walls, an inclined floor in the bottom of said housing, a drain pipe connected to the lower rear portion of the housing, spray heads in the upper corners of said housing, pipes connected to said spray heads, a control box having said pipes connected thereto, means for selectively delivering water and drying air to said spray heads, an access door in one side of the housing and said access door having a window therein, animal restraining means for said animal bath, access openings in the top section of the housing, an anti-slip surface on said floor, flexible sealing stripping operatively connected to said floor, large springs interposed between the front portion of the floor and the bottom of the housing, and smaller springs interposed between the rear of the floor and the bottom of the housing whereby the weight of the animal being washed and dried will cause said floor to slope to drain water therefrom.

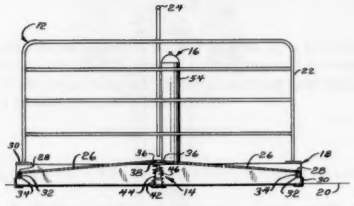
3,884,192

ANIMAL-OPERATED SPRAYER

Frank Knapp, Rt. 3, Mineral Point, Wis. 53565

Filed Oct. 15, 1973, Ser. No. 406,550
Int. Cl. A01k *29/00*
U.S. Cl. 119—159 **4 Claims**

1. An automatic animal sprayer comprising a frame having a pair of longitudinal sides in spaced relation which define a passageway therebetween having entrances at its opposite ends through either of which animals such as cattle may optionally enter and exit, first and second platforms disposed at ground level between said sides of the frame in end to end relation over which the entering animals walk to exit through the opposite entrance, each said platforms having their outer end pivotally connected to said frame adjacent a respective one of said entrances so as to be at proximate ground level, resilient means supporting the adjacent inner ends of said platforms for limited conjoint vertical movement of the platforms on the pivotal connections of their outer ends such that the platforms remain nearly horizontal in both their raised and lowered positions to facilitate the animals easily entering and exiting on walking through the passageway, spray nozzle means mounted on said frame above said platforms and directed to spray fluid on an animal in said passageway, a tank for containing fluid to be sprayed and a pump for dispensing of fluid from said tank to the spray nozzle means, said pump including an operating piston and a receiving cylinder positioned below said adjacent inner ends of the platforms, the cylinder having an inlet communicating with said tank and an outlet communicating through fluid lines to the spray nozzle means, the operating piston being supportingly engaged with the inner ends of said platforms such that the pump will dispense fluid through the fluid lines to the spray nozzle means in response to lowering of said platforms under the weight of an animal walking across the platforms, first check valve means at the intake of the cylinder which permit fluid to flow only from the tank to the pump cylinder, and further check valve means at said spray nozzle means and at the pump cylinder outlet which permits fluid to flow in a direction only away from the pump cylinder to the spray nozzle means such that the fluid lines remain fluid-loaded and the spray nozzle means are immediately responsive to operation of the pump with lowering of either platform under the weight of an animal entering the sprayer.



3,884,193

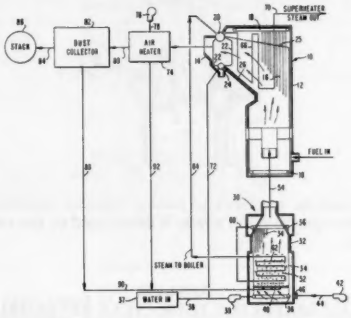
VAPOR GENERATING SYSTEM AND METHOD

Richard W. Bryers, Cranford, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.

Filed Mar. 22, 1974, Ser. No. 453,899
Int. Cl. F22b *33/00*
U.S. Cl. 122—4 D **12 Claims**

1. A vapor generating system comprising a primary boiler including a furnace, tube means for containing a heat exchange fluid and for selectively exposing said fluid to the heat from said furnace, and collection means for collecting the heated fluid from said tube means; means for continuously combusting a fluidized bed of fuel of a lower grade than that used in said furnace; additional tube means for containing a heat exchange fluid and for exposing said fluid to the heat from said bed; means for connecting said additional tube means to said collection means for transferring the heated fluid from said additional tube means to said collecting means; means for passing the combustion gases from said fluidized bed into said furnace where they combine with the combustion gases from said furnace, whereby heat recovery is provided from the fluidized bed combustion gases directly to the primary boiler; means for separating the solid particles from the combustion gases leaving said primary boiler; and means for passing said particles into said fluidized bed.

5. A method for generating vapor comprising the steps of passing a heat exchange fluid through a plurality of tubes in a heat exchange relation to a furnace, collecting the heated fluid from said tubes in a drum, continuously combusting a fluidized bed of fuel of a lower grade than that used in said furnace, passing heat exchange fluid through additional tubes in a heat



exchange relation to said fluidized bed; transferring the heated fluid from said additional tubes to said drum; passing the combustion gases from said fluidized bed into said furnace where they combine with the combustion gases from said furnace; separating the solid particles from the combustion gases leaving said furnace; and passing said particles into said fluidized bed.

3,884,194
RECOVERY OF THERMAL ENERGY FROM THE EXHAUST GASES OF AN INTERNAL COMBUSTION ENGINE

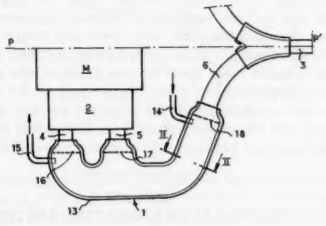
Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Dec. 17, 1973, Ser. No. 425,223

Claims priority, application France, Dec. 27, 1972, 72.47130

Int. Cl. F22b *1/18*

U.S. Cl. 122—7 R **7 Claims**



1. A steam generator operated by exhaust gases of an internal combustion engine, said generator comprising,

an exhaust pipe arranged to receive exhaust gases from an internal combustion engine, and

a vapourising duct located within the exhaust pipe, said vapourising duct being arranged to receive fluid to be heated, said vapourising duct having a wall which defines a heat exchange surface between the exhaust gases and the fluid, the exhaust pipe and the vapourising duct each being defined by two half-shells, the half-shells of the exhaust pipe, and the half-shells of the vapourising duct having a coincident joint surface, each said half-shell comprising,

parallel flanges, said flanges permitting alignment and assembly of the generator by welding, and

wherein at right angles to the joint surface of the half-shells, the vapourising duct has a small mean thickness with respect to its size in a direction parallel to the joint surface and in a plane at right angles to the direction of flow of the exhaust gases, and

wherein the vapourising duct has the shape of a flattened tube, the flat surfaces of which are parallel to the joint surface and said flat surfaces extending substantially throughout the width of the exhaust pipe.

3,884,195
ELECTRONIC CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

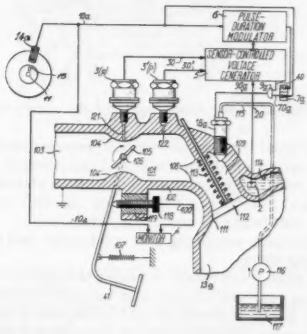
Fernand R. C. Murtin, and Loic Mercier, both of Paris, France, assignors to Société Industrielle d'Electronique et d'Informatique, Paris, France

Continuation-in-part of Ser. No. 7,781, Feb. 2, 1970, abandoned. This application Mar. 16, 1972, Ser. No. 235,289

Claims priority, application France, Jan. 31, 1969, 69.02057; Feb. 12, 1969, 69.03225; Mar. 7, 1969, 69.06443

Int. Cl. F02b *3/00*

U.S. Cl. 123—32 EA **11 Claims**



1. A fuel-injection-control system for an internal-combustion engine having a plurality of piston cylinders provided with intakes for combustion air, respective fuel injectors feeding said cylinders, and a shaft driven by the thrust of an exploding air-fuel mixture ignited in each cylinder, comprising:

electric actuating means for each of said fuel injectors;

a generator of synchronizing pulses having a cadence proportional to engine speed;

electric sensing means in said engine responsive to different combustion-determining parameters, said sensing means including a first pressure gauge positioned at a constriction of a common intake manifold for said cylinders, a second pressure gauge positioned at a location in said manifold downstream of said constriction, and a temperature-responsive resistor in close proximity to at least one of said cylinders;

voltage-generating means connected to said generator and to said sensing means for synthesizing from their outputs an analog voltage as a function of said parameters and said engine speed; and

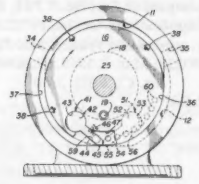
timing means controlled by said voltage-generating means for energizing said actuating means for a recurrent period proportional to said analog voltage, said timing means including an analog/digital converter and electronic switch means responsive to binary output signals from said converter, said switch means being connected to said generator for establishing recurrent operating cycles for said injectors under the control of said synchronizing pulses;

said voltage-generating means comprising a first operational amplifier having an input circuit including said first pressure gauge, a second operational amplifier in cascade with said first amplifier having an input circuit including said second pressure gauge, and a third operational amplifier in cascade with said second amplifier having an input circuit including said temperature-responsive resistor.

3,884,196
ROTARY ENGINE

Theodore Grob, 1549 Ulao Rd., Grafton, Wis. 53024, and Donald H. Tesker, 272 Shady Lane Rd., Saukville, Wis. 53080

Filed May 25, 1973, Ser. No. 364,020
Int. Cl. F02b *53/08*
U.S. Cl. 123—8.41 **7 Claims**



1. An internal combustion engine of the rotary type comprising

axially aligned combustion and compression chambers,

a rotor having a first portion in said compression chamber and a second portion in said combustion chamber,

a fuel inlet port to said compression chamber and an exhaust port from said combustion chamber,

a wall mutually separating said combustion and compression chambers,

transfer passageway means extending through said wall and opening onto said chambers at locations whereby to be closed during a portion of each revolution of said rotor, said transfer passageway means comprising a plurality of openings through said wall and extending over a substantial arcuate distance to transfer compressed gas from said compression chamber to said combustion chamber at a gradually increasing pressure throughout a substantial portion of each revolution of said rotor, and

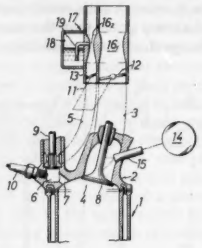
means for igniting the compressed gas in said combustion chamber while said transfer passageway means is closed by said rotor.

3,884,197
INTERNAL COMBUSTION ENGINE

Kiyoshi Miyaki, Asaka; Akira Okubo, and Sakuji Arai, both of Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 2, 1973, Ser. No. 375,497
Claims priority, application Japan, July 5, 1972, 47-67262
Int. Cl. F02b *19/10*
U.S. Cl. 123—75 B **4 Claims**

1. An internal combustion piston engine comprising: a relatively large main combustion chamber for receiving a lean air-fuel mixture; a relatively small auxiliary combustion chamber for receiving a rich air-fuel mixture; a torch nozzle connecting the chambers; means for igniting the rich mixture in the auxiliary combustion chamber to project a flame through the torch nozzle into the main combustion chamber; a main inlet passage communicating with the main combustion chamber and including a main venturi and a main throttle valve; an auxiliary inlet passage communicating with the auxiliary combustion chamber and including an auxiliary venturi and an auxiliary throttle valve; inlet valves at the chambers for controlling the inlet passages; the effective area of the auxiliary venturi being smaller than the effective area of the torch

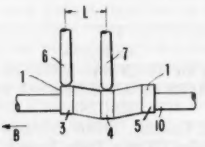


nozzle and the auxiliary inlet passage whereby maximum inlet flow through the torch nozzle is determined by the auxiliary venturi.

3,884,198
CAM SHAFTS FOR FOUR CYCLE REVERSIBLE INTERNAL COMBUSTION ENGINES

Takashi Ito, Tokyo, Japan, assignor to Mitsui Shipbuilding & Engineering Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1972, Ser. No. 295,905
Claims priority, application Japan, Oct. 9, 1971, 46-92966
Int. Cl. F01l *1/34*
U.S. Cl. 123—90.18 **1 Claim**



1. In a four cycle reversible internal combustion engine having spaced valve operating rods, a cam shaft for actuating suction and exhaust valves, said cam shaft comprising three spaced apart cams, an intermediate cam of which is disposed eccentrically with respect to the cams on opposite sides thereof and inclined surfaces are formed between said intermediate cam and the other two cams, said intermediate cam actuating the suction valve upon forward rotation and actuating the exhaust valve upon reverse rotation, the spacing between adjacent pairs of cams being equal to the spacing between said operating rods for adjacent suction and exhaust valves of said engine for reducing the inclination angle of said inclined surfaces between said adjacent pairs of cams.

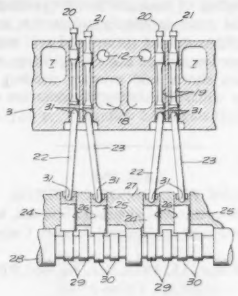
3,884,199
ENGINE VALVE OPERATING SYSTEM

Shoichiro Irimajiri, Kawagoe, and Masayuki Kumada, Hanno, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1973, Ser. No. 420,228
Claims priority, application Japan, Dec. 11, 1972, 47-141214
Int. Cl. F01l *1/14*
U.S. Cl. 123—90.61 **5 Claims**

1. An engine having an engine head, a main combustion chamber and an auxiliary combustion chamber connected to the main combustion chamber through a torch nozzle; the chambers having respectively, a main and an auxiliary intake valve and the main chamber also having an exhaust valve; said engine comprising: intake and exhaust passages extending into one side of the engine head to communicate with the intake

and exhaust valves; intake valve and exhaust valve actuating tappets slidably disposed in immediately adjacent parallel relation passing between said intake and exhaust passages in the engine head; actuating means operatively connecting the



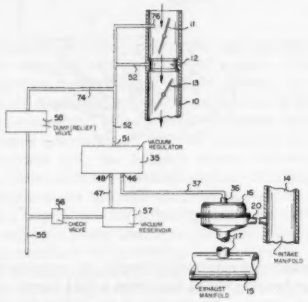
intake valve tappet to both of the intake valves; a cam shaft; a corresponding pair of cam actuated slidable tappets disposed in parallel relation adjacent the cam shaft; and means connecting the valve actuating tappets and cam actuated tappets.

3,884,200

EXHAUST GAS RECIRCULATION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Roland B. Caldwell, Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

Filed Aug. 3, 1971, Ser. No. 168,595
Int. Cl. F02m *25/06*
U.S. Cl. 123—119 A **29 Claims**



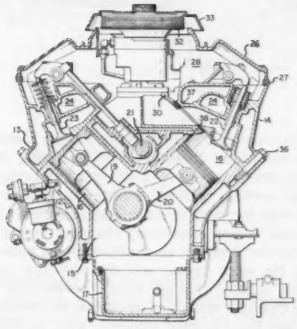
1. In an internal combustion engine including a carburetor having a venturi throat, an intake manifold, an exhaust gas manifold and structure defining a passageway between said intake and exhaust manifolds: exhaust gas recirculating valve means effective to control the flow of exhaust gas through said passageway, said valve means comprising structure defining a vacuum chamber and a valving member operative in response to changes in vacuum pressure in said chamber to vary the rate of flow of exhaust gas through said passageway, vacuum control means for controllably communicating said vacuum chamber to said intake manifold said vacuum control means comprising a vacuum regulator having a vacuum inlet communicating with said intake manifold, a regulated vacuum outlet communicating with said vacuum chamber and a pressure signal inlet, and a pressure signal passage between said venturi throat and said pressure signal inlet, said regulator means controllably communicating said intake manifold and said vacuum chamber in relation to the pressure signal level communicated from said venturi throat to said pressure signal inlet.

3,884,201

MARINE ENGINE

James D. Cregan, Baldwinsville, N.Y., assignor to American Challenger Corporation, Fulton, N.Y.

Filed Mar. 27, 1973, Ser. No. 345,275
Int. Cl. F02m *25/06*
U.S. Cl. 123—119 B **2 Claims**

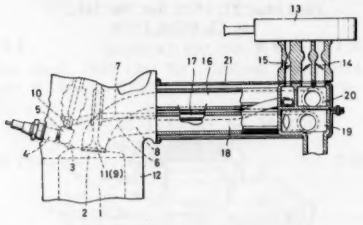


1. In an internal-combustion engine of the type including:
a cylinder block,
first and second banks of cylinders is said block, said banks being upwardly and outwardly inclined,
a pair of cylinder heads secured to said block,
a cover extending across and sealed to said cylinder heads and cylinder block, whereby a compartment is formed between said cylinder heads by the cylinder heads, cylinder block, and cover,
a crank case at the lower portion of said cylinder block, and passage means between said compartment and said crank case, the improvement comprising:
a centrally feeding manifold mounted in said compartment centrally of said cylinders and having an entrance in the top thereof,
a downdraft carburetor mounted on top of said manifold and connected to the entrance of said intake manifold, said downdraft carburetor having a vertical passageway for flow of air through a top opening downwardly into said entrance of said intake manifold, said separately feeding manifold being separate from said cylinder block, said cylinder heads being secured to said cylinder block over said manifold to hold said separate manifold on said cylinder block solely by the clamping of said heads to said block,
an annular extension surrounding an opening on said cover above said carburetor, said annular extension and said carburetor forming an annular passageway, and
a cover for said carburetor positioned above said annular extension to provide an opening between said annular extension and said cover for flow of air inwardly to and downwardly through said carburetor, said flow of air applying by eductive effect a negative pressure to said annular passageway which acts through said passage means to provide positive crank case ventilation.

3,884,202
ENGINE INTAKE AND EXHAUST APPARATUS

Yoshitoshi Sakurai, Kawasaki, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 22, 1973, Ser. No. 372,658
Claims priority, application Japan, June 28, 1972, 47-76218
Int. Cl. F02b *19/10, 19/16*
U.S. Cl. 123—122 AB 2 Claims

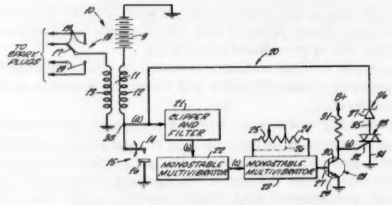


1. In an internal combustion engine having a main and an auxiliary combustion chamber communicating through a torch nozzle, the improvement comprising, in combination: a main and an auxiliary carburetor means, a riser device communicating with the main and auxiliary carburetor means, an intake passage means connecting the riser device with the main combustion chamber, an auxiliary intake passage means connecting the riser device and the auxiliary combustion chamber, an exhaust passage means connecting the main combustion chamber with the riser device, the auxiliary intake passage means being formed integrally with the exhaust passage means, a casing disposed about the main intake passage means, the auxiliary intake passage means, the exhaust passage means and the riser device, said casing extending from around the riser device to the engine.

3,884,203
ENGINE RPM CONTROL SYSTEM

Arnie L. Cliffgard, 9268 Daisy Ave., Fountain Valley, Calif. 92708

Filed Apr. 23, 1973, Ser. No. 353,404
Int. Cl. F02p *9/00*; F02b *77/00*
U.S. Cl. 123—118 19 Claims



1. In an internal combustion engine of the type including an ignition system comprising an ignition coil having primary and secondary windings, the primary winding being connected in circuit with a battery and a set of points and the secondary winding being connected in circuit with one or more spark plugs, the improvement comprising means for limiting the revolutions per minute of said engine, said means comprising:

means operatively coupled to said ignition system for generating a gating pulse which starts a fixed time interval after opening of said points and has a time duration which is a function of the desired speed of said engine;

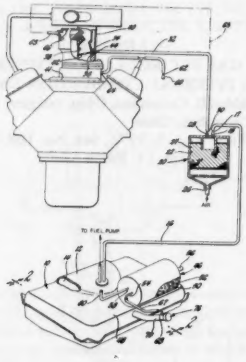
gating means having a gating terminal and first and second main terminals, said gating terminal being operatively coupled to receive said gating pulse, said gating means permitting conduction between said main terminals during said gating pulse; and

threshold switching means connected between one of said main terminals of said gating means and one side of said primary winding of said coil for preventing conduction between said main terminals unless the voltage across said threshold switching means and said main terminals exceeds a predetermined threshold voltage whereby said gating means shorts said primary winding during said gating pulse when the voltage thereacross exceeds said predetermined threshold voltage.

3,884,204
TANK FILL VAPOR CONTROL

Homer V. Krautwurst, and Cristian F. Schulitz, both of Rochester, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 15, 1974, Ser. No. 461,010
Int. Cl. F02m *25/08*
U.S. Cl. 123—136 3 Claims



1. In an internal combustion engine, an evaporation control system for limiting vapor loss from a fuel supply including a fuel tank having a vapor space and an air-fuel supply carburetor for directing a predetermined fuel charge into the intake manifold of an internal combustion engine comprising: means for adsorbing vapor generated from the tank during normal vehicle operation including a first canister means having a first predetermined volume, means for communicating the interior of said first canister means with an engine carburetor for purging vapor from said first canister means during engine operation for consumption in the engine, second vapor adsorbing means for adsorbing vapors produced within said tank during a fill phase of operation including second canister means having a second predetermined volume greater than said first predetermined volume to adsorb increased volume of vapors produced during tank fill operation, and means for purging vapors from said second canister means for consumption with the engine during engine operation at a lesser rate than the rate of withdrawal of vapors from said first canister means thereby to avoid excessive enrichment of the air-fuel mixture to the intake manifold of the internal combustion engine so as to prevent excessive exhaust emissions therefrom.

3,884,205

CENTRIFUGAL RPM GOVERNOR FOR FUEL INJECTED INTERNAL COMBUSTION ENGINES

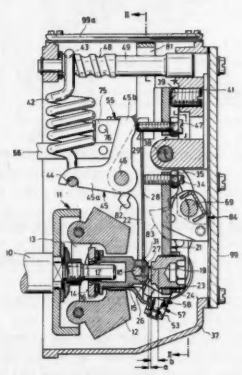
Heinrich Staudt, Markgroningen-Talhausen; Ernst Ritter, Stuttgart; Hans-Jurgen Jaenke, Ditzingen, and Rolf Muller, Stuttgart-Freiberg, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Aug. 10, 1973, Ser. No. 387,501

Claims priority, application Germany, Aug. 10, 1972, 2239372

Int. Cl. F02d 1/04

U.S. Cl. 123—140 R **16 Claims**



1. In a centrifugal rpm regulator for fuel injected internal combustion engines, especially diesel engines, including a housing mounting; centrifugal weight means, an adaptor sleeve slidably displaceable under the influence of the centrifugal weight means and as a function of engine rpm, at least one two-armed intermediate lever, an operating lever, a fuel quantity control rod, the adaptor sleeve transmitting the forces associated with its controlled motions resulting from its slidable displacement through the intermediate lever to the fuel quantity control rod for adjusting the fuel quantity delivered by an injection pump used in conjunction with the regulator, the intermediate lever having a pivot point which is changeable in dependence on the pivotal position of the operating lever, the movement of the control rod being limited in the direction of increasing fuel supply by an abutment structure including a cam plate, and at least one control arm through which the abutment structure is connected to the adaptor sleeve, the abutment structure being fixedly connected to the regulator housing and being pivotable as a function of engine rpm to thereby determine the maximum fuel quantity, the improvement comprising:

a. an abutment lever having a cam follower member at one end thereof;

b. means connecting said abutment lever to said control rod;

c. a control lever having a lever arm;

d. means mounting said abutment lever to said lever arm for free pivotal movement relative to said lever arm; and

e. means mounting said control lever to the housing for pivotal movement relative thereto, said abutment lever being pivotable due to its connecting and mounting means thereby causing said cam follower member to abut said cam plate and limit the maximum fuel quantity delivered by the injection pump for a given engine rpm.

3,884,206

CENTRIFUGAL RPM REGULATOR FOR INTERNAL COMBUSTION ENGINES

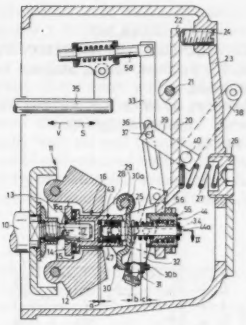
Ernst Ritter, Hattenbuhl, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Jan. 31, 1974, Ser. No. 438,416

Claims priority, application Germany, Feb. 20, 1973, 2308260

Int. Cl. F02d 1/04

U.S. Cl. 123—140 R **4 Claims**



1. In a centrifugal rpm regulator for fuel injected internal combustion engines including a housing mounting, centrifugal weight means, an adapter sleeve slidably displaceable under the influence of the centrifugal weight means and as a function of engine rpm, a two-armed intermediate lever, a fuel quantity control rod, the adapter sleeve transmitting the forces associated with its controlled motions resulting from its slidable displacement through the intermediate lever to the fuel quantity control rod for adjusting the fuel quantity delivered by an injection pump used in conjunction with the regulator, a force-transmitting lever, stop means mounted to the housing against which one end of the force-transmitting lever is supported, and at least one regulating spring supported in the housing and exerting a force against the force-transmitting lever, the adapter sleeve being mounted so as to also act against the force-transmitting lever, the improvement comprising:

A. an adjustment device having:

a. a pivotable lever connecting the adapter sleeve with the intermediate lever, said pivotable lever being pivoted at one of its ends at least mediately to the intermediate lever and eccentrically with respect to the adapter sleeve and including two stop surfaces;

b. a first elastically yieldable stop means having a first adjustment spring;

c. a second elastically yieldable stop means having a second adjustment spring, said first and second stop means engaging respective ones of said stop surfaces; and

d. an idle control spring;

B. an operating lever; and

C. a guide lever, and wherein the adapter sleeve defines a central bore and axis;

the intermediate lever has a slot in one of its arms;

said guide lver has a pin at one end thereof which serves as the pivot pin for the intermediate lever, said pin being engageable within said slot;

said operating lever being pivotably mounted to the housing and engageable with said guide lever so that the position of the intermediate lever is changeable in dependence on the pivotal position of said operating lever;

said stop surfaces being arranged at the level of the adapter axis between said first and second stop means and facing away from each other;

said first stop means being pretensioned by said first adjustment spring and being mounted within the control bore of the adapter sleeve;

said second stop means being pretensioned by said second adjustment spring and said idle control spring and being mounted to an extension of the force-transmitting member; and

said regulating spring serves as a maximum rpm spring which is at least mediately supported within the housing.

3,884,207

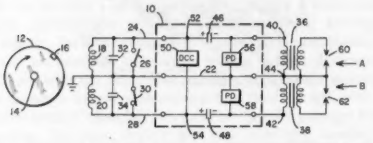
MAGNETO-GENERATOR IGNITION SYSTEM

Andrew Kuehn, III, St. Paul, Minn., assignor to Systematics, Inc., St. Paul, Minn.

Filed Sept. 6, 1973, Ser. No. 394,636

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 R **2 Claims**



1. In an ignition system for a two-cylinder internal combustion engine of the type having for each cylinder an ignition coil cooperating with a magneto-generator for producing a current in said coils, a set of cam operated breaker points for periodically coupling the current flow from said magneto-generator to said ignition coils and thereby producing a high voltage pulse for delivery to the spark plugs, the improvement comprising;

a. first and second energy storage devices having two terminals connected in series between said magneto-generators and said ignition coils;

b. first and second unidirectional current conducting devices connected in series with said first and second energy storage devices and said magneto-generators for causing said first and second energy storage devices to be charged with a predetermined polarity;

c. a discharge control circuit adapted to be alternately connected between said first energy storage device and one of said ignition coils and the second energy storage device and the other of said ignition coils by means of said breaker points, for alternately controlling the discharge of said first and second energy storage devices through its associated ignition coil; and

d. said discharge control circuit comprising:

1. a voltage divider connected in parallel with the magneto-generators associated with said two cylinders;

2. a semiconductor switching device having an input electrode, and output electrode and a control electrode;

3. means connecting said input and output electrodes to one terminal of said first and second energy storage devices respectively; and

4. means connecting said control electrode to said voltage divider such that when the voltage applied to said control electrode exceeds a predetermined threshold, one of said energy storage devices is discharged through a path including said semiconductor switching device, one of said ignition coils and the breaker points associated with the other of said ignition coils.

3,884,208

TRANSISTORIZED IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

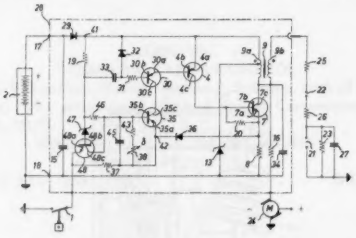
Richard Beuter, Plettenberg, Germany, assignor to Brown, Boveri and Cie A.G., Mannheim, Germany

Filed June 3, 1974, Ser. No. 480,542

Claims priority, application Germany, June 12, 1973, 2329920

Int. Cl. F02p *3/02*

U.S. Cl. 123—148 E **4 Claims**



1. An ignition system energized by a d-c power source for internal combustion engines including

a. an ignition coil (**9**) having a primary winding (**9***a*) and a secondary winding (**9***b*);

b. an interrupter (**1**) for interrupting the current flow in said ignition coil (**9**);

c. a main transistor (**7**) controlling the current flow in said primary winding (**9***a*) of said ignition coil (**9**), said primary winding (**9***a*) of said ignition coil (**9**) being arranged in series with the collector-emitter circuit (**7***a*, **7***c*) of said main transistor (**7**) and in series with a negative feed-back resistor (**8**) connected to the negative terminal of a d-c power supply;

d. a first auxiliary control transistor (**4**) having a collector (**4***c*) connected to the base (**4***b*) of said main control transistor and an emitter (**4***a*) connected to a d-c power supply;

e. a pre-transistor (**30**), a second auxiliary control transistor (**35**) and a regulating transistor (**48**), the collector (**48***c*) of said regulating transistor (**48**) being connected to the base (**35***b*) of said second auxiliary control transistor (**35**), the collector (**35***c*) of said second auxiliary control transistor (**35**) being connected to collector (**30***c*) of said pre-transistor, the emitter (**35***a*) of said second auxiliary control transistor (**35**) being connected by the intermediary of a resistor (**37**) to one contact of said interrupter (**1**) and to the emitter (**48***a*) of said regulating transistor (**48**), the emitter (**35***a*) of said secondary auxiliary control transistor (**35**) being further connected by the intermediary of a diode (**36**) to the emitter (**7***a*) of said main transistor (**7**) and to said negative feed-back resistor (**8**), the cathode of said diode being arranged adjacent the emitter (**35***a*) of said second auxiliary control transistor (**35**) and the anode of said diode (**36**) being arranged adjacent the emitter (**7***a*) of said main transistor (**7**), said collector (**48***c*) of said regulating transistor being further connected to the base (**48***b*) thereof by the intermediary of a resistor (**46**) and a Zener diode (**47**), said base (**35***b*) of said second auxiliary control transistor (**35**) being connected to the positive terminal of a d-C power supply by the intermediary of resistor means (**46, 19**) and

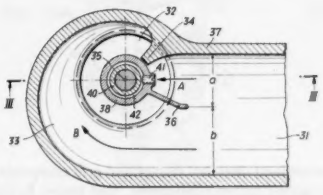
f. a network including a resistor (**43**), a temperature sensitive resistor (**38**), a damping capacitor (**45**) and additional resistor means (**37**) interconnecting said base (**35***b*) of said second auxiliary control transistor (**35**) with the emitter (**48***a*) of said regulating transistor (**48**) and with one contact of said interrupter (**1**).

3,884,209

INLET PORT FOR INTERNAL COMBUSTION ENGINES

Hans List; Josef Affenzeller, and Karl Kirchweger, all of Graz, Austria, assignors to Hans List, Graz, Austria

Division of Ser. No. 271,234, July 13, 1972, abandoned. This application July 18, 1973, Ser. No. 380,240
Claims priority, application Austria, May 30, 1972, 2827/72
Int. Cl. F02f *1/42*
U.S. Cl. 123—188 M 6 Claims



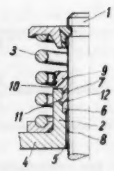
1. A cylinder head structure for internal combustion engines, especially diesel engines, comprising at least one inlet valve having a valve stem, a valve seat for said inlet valve, an inlet duct having an elongated feed portion extending from an inlet aperture of the cylinder head to a chamber formed by said inlet duct above and in proximity to said inlet valve, said chamber forming a spiral-shaped inlet duct portion wound around said valve stem and extending downward to said valve seat, a valve guide bearing extending into the chamber and encompassing said valve stem, a rib located in said spiral-shaped duct portion and comprising a stationary and a rotatable portion, the stationary portion of said rib extending from a point of the wall of said spiral-shaped duct portion located close to the axis of the associated cylinder as far as said valve stem and said valve guide bearing in a plane including the valve stem axis, a sleeve rotatably arranged on said valve guide bearing and secured against axial displacement, said sleeve carrying the rotatable portion of the rib, protruding into the feed portion of the inlet duct in a plane including the valve stem axis and dividing the cross-section of the inlet duct in two.

3,884,210

VALVE STEM GUIDE FOR INTERNAL COMBUSTION ENGINES

Alois Ferch, Fischerstrasse 9, 404 Neuss/Rhine, Germany

Filed July 19, 1973, Ser. No. 380,531
Claims priority, application Germany, July 21, 1972, 2235895
Int. Cl. F01l *3/08*; F16k *41/00*
U.S. Cl. 123—188 GC 13 Claims



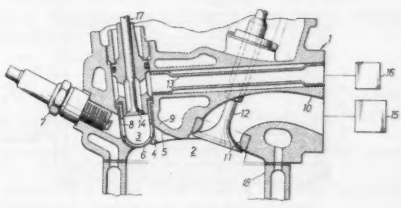
1. Valve stem guide for internal combustion engines comprising a cylinder head wall, a valve stem guide connecting piece connected to said cylinder head wall, said guide connecting piece forming a guide bore extending therethrough and communicating with the interior of said cylinder head wall and having an end face at its end opposite the interior of said cylinder head wall, and a sleeve-type oil scraper formed of an elastic material disposed within and in positive engagement with said guide connecting piece, wherein the improvement comprises that said guide connecting piece has an enlarged bore section coaxial with and extending radially outwardly from said guide bore and extending axially from the end face of said guide connecting piece toward but spaced from the interior of said cylinder head wall, said enlarged bore section having a depression formed therein extending radially outwardly from the surface thereof relative to the axis of said enlarged bore section, an outwardly extending projection formed integrally on the outer surface of said sleeve-type oil scraper extending into said depression in matching and positive engagement therewith, and said oil scraper extending axially outwardly from the end face of said guide connecting piece at the end of said enlarged bore section and including an integral annularly-shaped collar extending radially outwardly over and in contact with the end face of said guide connecting piece.

3,884,211

COMBUSTION CHAMBER DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Shizuo Yagi, Asaka; Yoshitoshi Sakurai, Kawasaki, and Isamu Minowa, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 29, 1973, Ser. No. 375,060
Claims priority, application Japan, June 30, 1972, 47-77413
Int. Cl. F02b *23/00*, *75/02*
U.S. Cl. 123—191 S 3 Claims

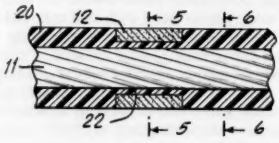


1. A combustion chamber system for a reciprocating internal combustion engine, comprising a main combustion chamber including a piston defining one wall thereof and a cylinder head defining a second wall thereof, an auxiliary combustion chamber positioned within said cylinder head, said auxiliary combustion chamber including a thin walled cup lining said auxiliary combustion chamber and spaced from said cylinder head, said cylinder head including a first opening through which said thin walled cup is exposed to said main combustion chamber and a second opening through said cylinder head and said thin walled cup defining a passageway between said auxiliary combustion chamber and said main combustion chamber, said second opening being displaced from said first opening.

3,884,212
WIRE SAW

Leonard O. Armstrong, and Donald D. Fish, both of Bedford, Ind., assignors to W. F. Meyers Company, Inc., Bedford, Ind.

Filed Nov. 1, 1973, Ser. No. 411,644
Int. Cl. B28d 1/08
U.S. Cl. 125—21 2 Claims

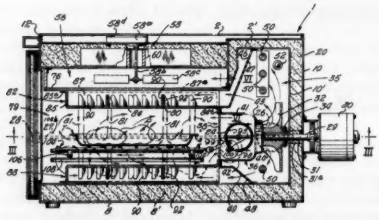


1. A saw comprising:
a. an endless flexible wire cable,
b. a plurality of abrasive cutting element sleeves surrounding said cable and spaced at intervals along the length thereof, each of said sleeves having on one end face a key integral therewith and extending axially therefrom, and
c. a resilient material surrounding said cable between abrasive cutting elements and providing an uninterrupted continuous surface of substantially uniform diameter for said saw, said resilient material having a portion mating with each said axially extending key and restraining said abrasive bearing sleeves from relative rotation around said wire cable and also preventing physical contact between said sleeves and cable.

3,884,213
COOKING APPARATUS

Donald P. Smith, P.O. Box 34568, Dallas, Tex. 75234

Filed Mar. 30, 1973, Ser. No. 346,416
Int. Cl. F24c 15/16
U.S. Cl. 126—21 A 10 Claims

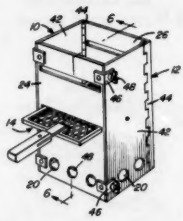


1. Apparatus to transfer heat to a product comprising: a cabinet; a jet plate in said cabinet, said jet plate having a plurality of passages formed therein arranged to form disctete jets of fluid; a plenum associated with one side of said jet plate arranged to force pressurized fluid through said passages; impeller means having a discharge passage communicating with said plenum and having an intake passage communicating with the inside of the cabinet on the other side of said jet plate; means to control temperature of fluid forced through said passages in said jet plate; product support means in said cabinet, said product support means being spaced from said jet plate; and means to move said jet plate relative to said product support means such that the discrete jets of fluid sweep across the surface of the product on said product support means, said passages in said jet plate being spaced such that fluid drawn to the intake opening of said impeller means flows between said discrete jets of fluid.

3,884,214
CHARCOAL STARTER AND GRILL

John A. Duncan, 843 Central, Coos Bay, Oreg. 97420

Filed June 14, 1973, Ser. No. 369,932
Int. Cl. F24c 1/16
U.S. Cl. 126—25 B 1 Claim

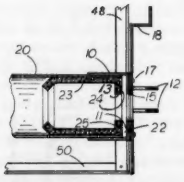


1. A combined charcoal starter and grill comprising a vertically elongated rectangular sleeve, said sleeve having a constant cross-sectional area throughout the full height thereof, said sleeve comprising a front wall, a rear wall, and opposed side walls, combustion air intake holes provided through the lower portion of each of the sleeve walls, an elongated charcoal support, said charcoal support comprising a flat panel-like portion including a rigid frame and a flat expanded mesh section supported thereby, and a wooden handle fixed to the frame and projecting outwardly therefrom, first and second pairs of opposed slots formed within said front and rear walls for the selective reception of the charcoal support therethrough and therebetween, said first pair of slots being located at approximately mid-height on the sleeve, said second pair of slots being located between the first pair of slots and the upper end of the sleeve, said sleeve being collapsible, said front wall being removable, said side walls each being hinged, along one edge thereof, to the corresponding side of the rear wall for an orientation of all of the walls into a collapsed position in overlying parallel relation to each other, said front wall including upper and lower pairs of edge mounted rearwardly projecting strap legs positionable in overlying relation to the erected opposed side walls, and upper and lower securing bolts received through the strap legs and adjoining side wall portions for a retention of the front wall to and between the erected side walls.

3,884,215
RADIANT SPACE HEATER

Irvin L. Schlosser, 29 E. Broad St., Hatfield, Pa. 19440

Division of Ser. No. 372,076, June 21, 1973, Pat. No. 3,832,991. This application May 13, 1974, Ser. No. 469,412
Int. Cl. F24c 3/00
U.S. Cl. 126—91 A 5 Claims



1. In a space heater, the combination of a plate having an opening therethrough for the passage of a combustion flame and having a collar surrounding said opening, a combustion tube having an end slidably mounted in and supported by said collar, and heat resistant material lining the interior of said tube at said end and movable with the tube end into a gasket

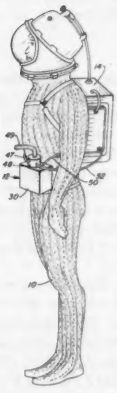
sealing contact with said plate on lengthwise heat expansion of said tube.

3,884,216

ELECTROCHEMICAL ENERGY SOURCE FOR DIVER SUIT HEATING

Joseph F. McCartney, Solana Beach, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 19, 1974, Ser. No. 507,645
Int. Cl. A61f 7/06
U.S. Cl. 126—204 12 Claims



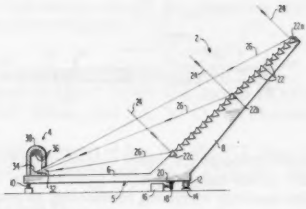
1. Apparatus for heating an undersea diver comprising:
a. a diver's suit having passage means therein for circulation of a heated liquid throughout said suit adjacent to the diver's body;
b. said passage means having an inlet and an outlet thereto;
c. a heating unit on said diver's suit for heating and circulating said liquid;
d. said heating unit including a chamber having a heated fluid outlet communicating with the inlet to said diver's suit circulation passage means and a fluid inlet communicating with the outlet to said diver's suit circulation passage means;
e. pump means for circulating heated fluid from said heating unit through said diver's suit circulation passage means;
f. a seawater electrolyte inlet means to said heating unit chamber;
g. an electrochemical heat source assembly within said heating unit chamber, said heat source assembly comprising:
1. a plurality of magnesium anodes and metal cathode plates alternately positioned in equally spaced apart relationship to allow free passage of seawater electrolyte and reaction products;
2. means for short-circuiting said anode plates to said cathode plates, where upon admission and circulation of seawater electrolyte into said heating unit heat is generated by the reaction of said magnesium anodes with said seawater;
3. said heat of reaction being imparted to said liquid which is circulated throughout said diver's suit;
g. spacing control means for varying the electrode gap between said anode and cathode plates to thereby control the rate of reaction and heat output

3,884,217

METHOD AND APPARATUS FOR COLLECTING SOLAR ENERGY

Lloyd Lore Wartes, Denver, Colo., assignor to Ecothermia, Inc., Denver, Colo.

Filed Sept. 20, 1972, Ser. No. 290,663
Int. Cl. F24v 3/02
U.S. Cl. 126—270 12 Claims



1. Apparatus for collecting radiant solar energy comprising a horizontally elongated energy receiving means, a reflector assembly located in the path of radiant solar energy for reflecting said energy upon the energy receiving means, said reflector assembly having a plurality of reflector units each of which includes a reflector body with a flat horizontally elongated reflective surface which is rotatable about a vertically immovable substantially horizontal axis of rotation which is spaced from the horizontal axes of rotation of other said reflector units, and means for rotatably positioning said reflector bodies about their respective axes of rotation to produce a convergence of radiant solar energy reflected therefrom along the length of the horizontally elongated energy receiving means, said reflector bodies being geometrical prismatic elements with the reflective surfaces thereof constituting one face of the prismatic structure, said prismatic elements having three faces of substantially similar dimensions.

3,884,218

METHOD OF INDUCING AND MAINTAINING VARIOUS STAGES OF SLEEP IN THE HUMAN BEING

Robert A. Monroe, Charlottesville, Va., assignor to Monroe Industries, Inc., Charlottesville, Va.

Filed Sept. 30, 1970, Ser. No. 76,923
Int. Cl. A61b 19/00
U.S. Cl. 128—1 C 6 Claims

1. A method of inducing sleep in a human being, comprising the steps of:
a. generating an audio signal representing a familiar, repetitive, pleasing sound;
b. generating a signal approximating a human EEG signal waveshape characteristic of a state of sleep;
c. amplitude modulating the audio signal with the EEG signal to produce an output signal; and
d. producing an audible sound signal from the output signal for listening by a human being.

3,884,219

SYSTEM FOR DETERMINING TEMPERATURE AND RESPIRATION RATE

Philip C. Richardson; Emmett L. Hudspeth; Allen D. Boger, Jr., and Jerald P. Dykstra, all of Austin, Tex., assignors to Medical Monitor Systems, Inc., Austin, Tex.

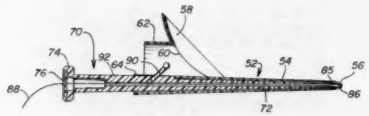
Filed Apr. 2, 1973, Ser. No. 346,952
Int. Cl. A61b 5/00
U.S. Cl. 128—2 R 23 Claims

1. Apparatus for determining the temperature and respiration rate of a patient which comprises:

an elongate probe including one end adapted to be positioned in the mouth of a patient;

a temperature responsive member supported at the tip of the one end of said probe for positioning in the mouth of the patient;

said temperature responsive member being adapted to provide a signal indicative of the temperature of the patient; and



a respiration responsive member supported on the probe at a point substantially displaced from the tip and in an angular upwardly extending relationship to said probe;

said respiration responsive member being adapted for actuation by air exhaled through the nose of the patient to provide a signal indicative of the respiration rate of the patient.

3,884,220

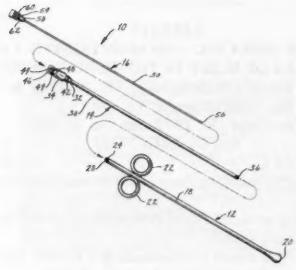
METHOD FOR INJECTING X-RAY CONTRAST MEDIA FOR VENOGRAPHY OF THE FEMALE PELVIS

Leo J. Hartnett, 6744 Clayton Rd., St. Louis, Mo. 63117

Continuation of Ser. No. 269,038, July 5, 1972, abandoned. This application Sept. 21, 1973, Ser. No. 399,424

Int. Cl. A61b *6/00*

U.S. Cl. 128—2 A **6 Claims**



1. The method of making a record of the venous plexus system of a uterus which comprises inserting into the uterus a tubular shaped instrument having a hollow core and a rounded probing end, probing with the instrument to locate the fundus with the rounded end, inserting a hollow needle having a piercing point and an opening through the center of said needle into the hollow core of the tubular instrument to penetrate the surface of the fundus, restraining the needle so that said penetration occurs only to a predetermined depth into but not through the wall of the uterus, injecting x-ray opaque material into the opening in the needle so that it passes through the needle into the spongy layer of said uterus and then exposing an x-ray film to record the passage of said x-ray opaque material through the venous plexus system of the uterus on the x-ray film.

3,884,221

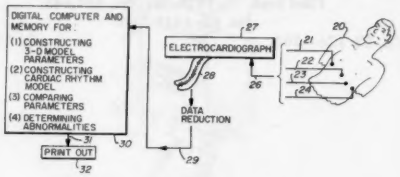
METHOD FOR THE CONSTRUCTION AND DIAGNOSIS OF THREE DIMENSIONAL ELECTROCARDIOGRAMS

George Eastman, 102 Old Clairton Rd., Pittsburgh, Pa. 15236

Filed June 10, 1969, Ser. No. 831,954The portion of the term of this patent subsequent to Aug. 20, 1990, has been disclaimed.

Int. Cl. A61b *5/04*

U.S. Cl. 128—2.06 V **10 Claims**



1. A method for determining the existence, nature and degree of cardiac abnormalities in a subject comprising,

obtaining frm the subject a plurality of electrocardiographic tracings, each of which tracings comprises a plurality of sets of deflections with each such set representative of one cardiac cycle of the subject,

measuring and recording from said tracing the values for each deflection in a selected number of sets,

constructing from said deflection values a plurality of parameters defining a three dimensional model of the subject's cardiac cycle,

constructing a three dimensional model of the cardiac cycle of said subject from said plurality of parameters constructed from said deflection values,

constructing from said deflection values a model expressing the inter and intra deflection occurrence times thereby defining the subject's cardiac rhythm and conduction,

comparing the values of said parameters and said three dimensional cardiac cycle model for said subject to the values of previously determined similar parameters and three dimensional cardiac cycle models for normal and abnormal cardiac conditions,

determining from said comparison the existence in the subject of various types of cardiac abnormalities.

3,884,222

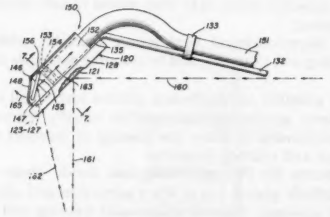
LARYNGOSCOPE

George Paul Moore, 2234 N.W. Sixth Pl., Gainesville, Fla. 32603

Filed Mar. 11, 1974, Ser. No. 449,821

Int. Cl. A61b *1/26*

U.S. Cl. 128—11 **28 Claims**



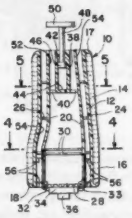
1. A laryngoscope and the like comprising a light-reflecting mirror shaped and arranged for insertion in a relatively inaccessible cavity such as the pharynx and the like of a subject for reflecting light originating outside of the subject against a part in the cavity to be viewed, a handle connected to said mirror for holding said mirror in the selected position for directing

light onto the part to be examined while the handle is held exteriorly of the subject, said mirror having a light-transmitting opening therein for transmission of light reflected from said mirror onto the part to be viewed and back through said opening, a light collecting and directing system mounted adjacent to said opening for receiving therethrough light transmitted from the part, and a coherent light-transmitting fiber optic bundle extending along said handle and having a light-receiving end disposed adjacent to said light collecting and directing system and having an exit end disposed outside of the subject for viewing by a user.

3,884,223
NASAL FILTER

John Keindl, Union, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed June 26, 1974, Ser. No. 483,089
Int. Cl. A61m *15/08*
U.S. Cl. 128—140 N **4 Claims**

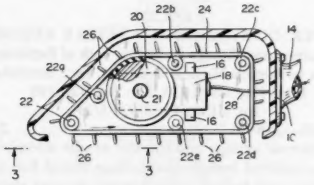


1. A nasal filter comprising a pair of insertable members shaped to conform to the shape of nasal passages; each member including: a central air intake passage extending longitudinally of each member; a filtering element at one end of said passage positioned transversely thereof; a closure at the other end of said passage slidably mounted therein for closing said passage upon the application of exhaling pressure on said closure, electrostatic precipitator means in said passage; an annular exhaust air canal around said central passage spaced therefrom having a one way valve therein for allowing egress of exhaled air only; a battery and electrical connectors connecting said battery to said precipitator means and serving also to hold said insertable members together.

3,884,224
ELECTRICAL BACK SCRATCHER

Adey M. Garcia, 64-20 Saunders St., Rego Park, N.Y. 11374

Filed Aug. 31, 1973, Ser. No. 393,684
Int. Cl. A61h *7/00*
U.S. Cl. 128—63 **5 Claims**

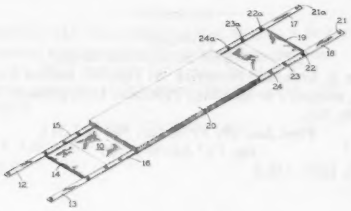


1. An electrical back scratcher comprising a housing having a top wall, a pair of side walls, a rear wall and an open bottom portion, an endless belt movable in said housing in parallel relationship to said top and rear walls, said endless belt being provided with teeth having an arcuate cross-section and rounded ends of flexible material and simulating human fingernails, said teeth being arranged in spaced rows about said belt's periphery, and extending through said open portion and means for driving said endless belt, said means for driving said endless belt being a hollow drum, an electrical motor secured to one of said side walls, said electrical motor having a drive shaft arranged parallel to said rear wall, said hollow drum being secured to said drive shaft, a plurality of idler rollers secured to one of said side walls for guiding said endless belt, a hollow handle having one end secured to said rear wall, an electrical cord extending through the other end of said handle and through said hollow handle into said housing and connected to said electrical motor, for connecting said device to an electrical power source.

3,884,225
BED PATIENT TURN AND HOLD DEVICE

Evelyn Ruth Witter, 1924 N.E. 7th Ct., Fort Lauderdale, Fla. 33304

Continuation-in-part of Ser. No. 355,972, June 1, 1973, abandoned. This application Apr. 8, 1974, Ser. No. 458,758
Int. Cl. A61g *7/10*
U.S. Cl. 128—133 **3 Claims**



1. In a device for turning a person lying on a bed having a rail and comprising a flexible sheet means to be wrapped around the person, and a cushion means on said sheet means at the middle for cushioning the person, said sheet means having side edges extending beyond said cushion means, the improvement which comprises:

first fastener means at a side edge of the sheet means for fastening the same to the rail;

and second fastener means releasably engageable with said first fastener means at the rail for releasably holding the sheet means at the rail and wrapped around the person on the bed;

said first fastener means comprising flexible straps extending from the sheet means at said one side edge, and a snap fastener element on the free end of each strap;

and said second fastener means comprising a plurality of snap fastener elements on the sheet means extending from said one side edge and spaced apart across its width in alignment with the snap fastener elements on the free ends of the straps for selective locking engagement individually by the latter.

3,884,226
APPARATUS FOR CORRECTING TONGUE THRUST

Harry W. Tepper, 535 Ocean Ave., Santa Monica, Calif. 90402

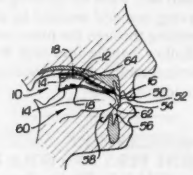
Filed Sept. 13, 1973, Ser. No. 397,172
Int. Cl. A61f *5/58*
U.S. Cl. 128—136 **2 Claims**

1. An apparatus for correcting tongue movements and positions comprising:

a first element means having front and rear ends adapted to be positioned adjacent the palate of a user for supporting said apparatus in the mouth of said user;

a second element means having front and rear ends pivotally connected at said front end to said front end of said

first element means, said second element means being pivotable between a first extended, at-rest position where said second element means is generally parallel to the dorsum of said tongue, and a second contracted, operative position where said second element means bears against the dorsum of the tongue; and



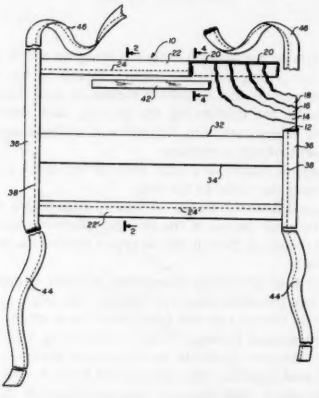
resilient band means connected laterally across said first element means and positioned between said first element means and said second element means for biasing said second element means rear end away from said first element means rear end and toward said first position.

3,884,227

DISPOSABLE SURGICAL MASK

William A. Lutz, and Frederick W. Zipf, III, both of Rumson, N.J., assignors to Blessings Products, Incorporated, Bound Brook, N.J.

Filed Jan. 29, 1973, Ser. No. 327,311
Int. Cl.[2] A61M *15/00*
U.S. Cl. 128—146.2 **7 Claims**



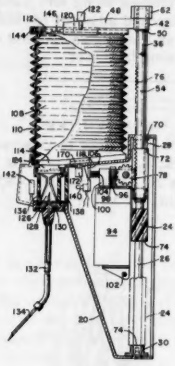
1. A disposable surgical mask comprising pleated plies of sheet material with the pleats extending across the face of the mask, binding covering the pleats at their ends, stitching through the binding and pleated material securing the pleats closed at the ends of the mask, the plies including inner and outer facings for the mask, a ply of filter material behind the front facing, the filter being made of material from which spicules of the filter become loosened during use of the mask, and a ply of barrier material between the filter and the inner facing of a porosity that stops spiclues of the filter from reaching the inner facing during use of the mask, and the barrier ply being made of tissue paper having a porosity of from 200 to 800 cu. ft./min (Gurley Permometer), a basis weight between 7 and 10 lbs./2880 sq. ft. and comprising at least 50% long fiber, and a wet strength of about 580 (machine direction) and 200 (cross direction) gms./inch.

3,884,228

INTRAVENOUS FEEDING SYSTEM

Steven Hahn, East Hampton, N.Y., assignor to The Lynkeus Corporation, East Hampton, N.Y.

Filed Feb. 26, 1974, Ser. No. 445,845
Int. Cl. A61m *05/14*
U.S. Cl. 128—214 F **12 Claims**



1. A closed intravenous feeding system comprising a feed container of collapsible fluid-tight construction adapted to be completely filled with fluid to be intravenously administered to a patient, an administration set detachably connected to said container, means for mechanically compressing said container and thereby forcing fluid out of the container into said administration set, means for controlling the rate of compression of said container and thereby controlling the rate of feed of fluid to the administration set, means for disabling said compression means and stopping compression of said container when the pressure of the fluid therein rises above a predetermined value, means for disabling said compressing means when said container has been emptied to a predetermined extent, means for producing an alarm signal when said compressing means becomes disabled, a drop chamber between said administration set and the lower end of said container, means for detecting the presence of fluid drops in said drop chamber, means for producing an alarm signal when drops fail to appear within said chamber during a predetermined period of time, said container being of accordian construction having upper and lower flanges, and said compressing means including a pair of vertically extending rods offset from said container, means for detachably connecting the upper ends of said rods to the upper flange of said container, and means including an electric motor and a solenoid operated clutch for positively moving said rods downwardly at a predetermined speed.

3,884,229

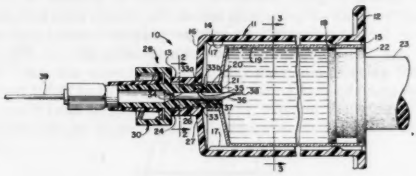
HYPODERMIC SYRINGE AND NEEDLE ASSEMBLY

Kenneth Raines, and George K. Burke, both of Bethlehem, Pa., assignors to Burron Medical Products, Inc., Bethlehem, Pa.

Filed Nov. 29, 1973, Ser. No. 420,199
Int. Cl. A61m *5/32, 5/24*
U.S. Cl. 128—218 N **2 Claims**

1. Hypodermic syringe and transfer needle assembly, comprising a cylindrical hypodermic syringe barrel for receiving and holding a vial having a puncturable stopper sealing one end thereof and containing a medicament and the like therein, said barrel having an open end and a closed end, an annular, radially inwardly projecting sealing rib in the barrel adjacent the open end thereof, a plurality of axially extending, circumferentially spaced apart guide ribs on an inner surface portion of the barrel extending from the closed end thereof to the sealing rib, said barrel having a reduced diameter, axially

outwardly extending hub on the closed end thereof, said hub having an axial bore therethrough with an enlarged diameter outer end portion, a plurality of axially extending splines in the enlarged diameter outer end portion, said transfer needle assembly having a reduced diameter, axially extending boss thereon adapted to be received in the bore through the hub, said boss having an inner end portion and an enlarged diameter outer end portion defining a shoulder with said inner end portion, a plurality of circumferentially spaced, axially extending splines on the enlarged diameter portion of the boss cooperably engageable with the splines in the bore of the hub to prevent turning of the needle assembly, said shoulder on the boss cooperably engaged with a shoulder in the bore of the hub to limit inward movement of the boss in the hub bore, cooperating snap locking means on the boss and in the bore



through the hub to lock the needle assembly to the barrel, said snap locking means including an annular, radially inwardly projecting locking flange in the inner end of the bore through the hub, an annular, radially outwardly projecting flange on the end of said boss adapted to be snapped behind the locking flange in the hub to lock the needle assembly to the barrel, said boss having an axial bore therethrough, a transfer needle fixed in the bore through the boss and including a sharpened end projecting beyond the end of the boss, and a Luer lock needle adapter on the other end of the needle assembly for attachment thereto of a piercing means, said transfer needle extending axially inwardly into the barrel and adapted to pierce the stopper in the vial for withdrawal of the medicament and the like from the vial and through the transfer needle assembly.

3,884,230

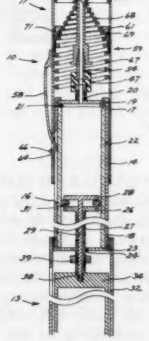
FLEXIBLE NEEDLE AND GUARD DEVICE FOR A HYPODERMIC SYRINGE

Goldwyn L. Wulff, 680 Nebraska S.W., Huron, S. Dak. 57350

Filed Sept. 27, 1973, Ser. No. 401,548

Int. Cl. A61m *5/32*

U.S. Cl. 128—221 **10 Claims**



1. A flexible needle and guard device for a hypodermic syringe having a barrel for holding an innoculant, a nozzle connected to said barrel through which said innoculant is ejected, and a plunger slidably disposed in said barrel for ejecting said innoculant; said flexible needle and guard device comprising:

- **an elongated hollow connector secured on one end to said nozzle and having the other end thereof projecting axially of said nozzle;**
- **a flexible tube having one end secured to said other end of said connector and having a second end projecting axially of said connector;**
- **an elongated hollow needle retainer secured on one end to said second end of said tube and having the other end projecting axially of said tube, said retainer spaced from said connector;**
- **a hollow needle detachably secured to said other end of said retainer and coaxially aligned in one position with said connector wherein said needle is pivotable from said one position to another position angularly inclined to said connector; and**
- **a first biasing means operably connected between said barrel and said needle for biasing said needle to said one position.**

3,884,231

SYRINGE HAVING PIVOTABLE NOZZLE PORTION

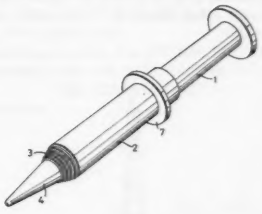
Clas Peters, Bryggargatan 25, Helsingborg, Sweden

Filed Feb. 11, 1974, Ser. No. 441,577

Claims priority, application Sweden, Feb. 22, 1973, 73024663

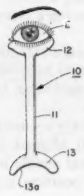
Int. Cl. A61m *1/00*

U.S. Cl. 128—235 **1 Claim**



1. A disposable applicator syringe of plastics for dispensing pastes, comprising a tubular body member, a plunger fitted in said body member and axially slidable therein, a pivotable tubular nozzle of a smaller cross sectional area than the body member and having a neutral position with its axis substantially in axial alignment with the common axis of the plunger and the body member, a frustoconical junction member connecting the inner end of the nozzle with the body member, said junction member having a number of folds of progressively reduced diameter from the body member to said inner end and mutually concentric and concentric with the plunger, with the body member and with the nozzle in the neutral position thereof, the mutual spacing and the dimensions of said folds being chosen to enable the manual tilting of the nozzle to any stable inclined position relative to the body member, and said nozzle remaining in any selected inclined position without any manual force acting thereupon, and said junction member permitting the repeated manual transfer of said nozzle from any inclined position to another inclined position and to its neutral position, thus enabling the use of the syringe for dispensing paste with its nozzle located in any number of selected angular positions relative to the body member.

3,884,232
INSTRUMENT FOR ADMINISTERING TO THE HUMAN EYE
Ruth Braun, 27060 Cedar Rd., Beachwood, Ohio 44122
Filed June 5, 1974, Ser. No. 476,588
Int. Cl. A61m 7/00
U.S. Cl. 128—260 7 Claims

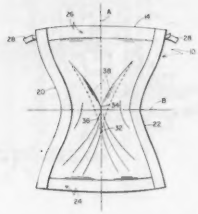


1. An instrument for administering to a human eye including a body of substantially sterile, resinous, organic material having two contact sections, each being provided with an outwardly directed concave contour adapted to be placed in close proximity to and in substantially matching curvature in contact with a side of a human eye to steady the eye and facilitate application to or removal from the eye of adjunctive material, one contact section having a greater outwardly directed concavity than the other and being adapted for use in contact with the upper side of a human eye.

3,884,233
TAMPON AND SUPPOSITORY COMBINATION
Betty Louise Summey, 5595 Severin Dr., La Mesa, Calif. 92041
Filed Sept. 4, 1973, Ser. No. 393,744
Int. Cl. A61f 13/20
U.S. Cl. 128—263 1 Claim

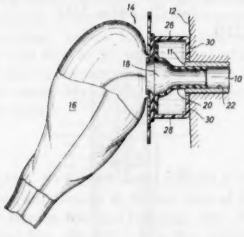
1. A tampon and suppository combination comprising:
an elongated hollow cylindrical cartridge container dimensioned for receiving a tampon therein, said cartridge container having walls defining first and second end openings;
a hollow cylindrical plunger slidably received in an end portion adjacent said first end opening of said cartridge container;
a tampon centrally and slidably received by said cartridge container;
a means for inserting a suppository and selectively closing the end portion of said second cartridge opening comprising a walled container of the same shape as the cartridge and having an open and closed end and having mounted therein a suppository loosely fitting but substantially filling the container, an inner portion of said wall of said container and the outer wall of said suppository being sized to snugly receive between them the walls of the second opening of the cartridge, so that when the container is placed upon said cartridge second opening a means is defined for frictionally inserting and retaining said suppository in said cartridge second end abutting the tampon but leaving an end portion of said suppository extending outwardly from the cartridge second end.

3,884,234
DISPOSABLE DIAPER
Glenn N. Taylor, Cary, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Oct. 18, 1973, Ser. No. 407,531
Int. Cl. A41b 13/02
U.S. Cl. 128—287 7 Claims



1. In a diaper having front and back waistline portions, a crotch portion therebetween, lateral margins extending between said waistline portions, and a surface for contact with the wearer, the improvement wherein, with respect to a fold line extending between said waistline portions approximately equidistant from said lateral margins, a portion of said surface on one side of said fold line, and along a line extending toward the diaper lateral margin, is secured to a similarly disposed surface portion on the other side of said fold line thereby forming a pocket in the rear portion of the diaper.

3,884,235
URINARY COLLECTION DEVICE
Mohammad Ajaz Sami, 3620 Barham Blvd., Los Angeles, Calif. 90068
Filed Apr. 16, 1974, Ser. No. 461,411
Int. Cl. A61f 5/44
U.S. Cl. 128—295 9 Claims



1. A urinary collection device for use with the ileal conduit comprising bag means adapted to receive the urine, conduit means connected between said ileal conduit and said bag means for directly carrying said urine to said bag, said conduit means comprising a projection member insertable in said ileal conduit, said projection member having an outer wall, said ileal conduit having an inner wall, said outer wall of said projection member conforming to and fitting against said inner wall of said ileal conduit, wherein the outer wall of said projection member forms a seal with the inner wall of said ileal conduit, said projection member comprising a soft distensible

enlarged distal end, said soft distensible enlarged distal end returning to its enlarged configuration when said projection member is fully inserted in said ileal conduit for self-retaining the projection member therein.

3,884,236

METHOD OF GLAUCOMA TREATMENT

Mikhail M. Krasnov, ulitsa Usievicha 11, kv. 83, Moscow, U.S.S.R.

Continuation of Ser. No. 295,468, Oct. 6, 1973, abandoned. This application Nov. 12, 1973, Ser. No. 414,774

Claims priority, application U.S.S.R., Oct. 28, 1971, 1712090

Int. Cl. A61b *17/36*

U.S. Cl. 128—303.1 **2 Claims**

2. A method of glucoma treatment using a pulsed Q-switched laser means, said means producing bursts of a coherent light beam containing wavelengths from about 6,943 A. to 10,600 A., said pulse duration being from about 10^{-7} sec. to 10^{-8} sec. the power output of said laser means being from about 10^6 W to 10^7 W, and said beam being focused into a spot about 0.1mm to 0.7mm in diameter, wherein the number of said bursts per single session of said treatment is not less than five.

3,884,237

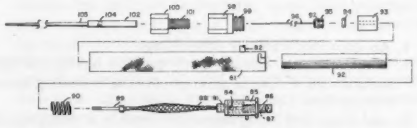
APPARATUS FOR INTRAOCULAR SURGERY

Conor C. O'Malley, 1323 Gleneyrie Dr., San Jose, Calif. 95125, and Ralph M. Heintz, Sr., 14734 Blossom Hill Rd., Los Gatos, Calif. 95030

Division of Ser. No. 264,166, June 19, 1972, Pat. No. 3,815,604. This application Dec. 5, 1973, Ser. No. 422,097

Int. Cl. A61n *3/02*

U.S. Cl. 128—303.14 **11 Claims**



1. In an apparatus for intraocular surgery such as cutting or severing of undesired material within the eyeball of a patient, the combination comprising a cutting electrode of very small diameter, an insulated tubular member having an open outer end in communication with an electrode-receiving bore extending longitudinally of said member for slidably and snugly receiving said cutting electrode, a source of electric current, means connecting said source to said cutting electrode and means reciprocating said cutting electrode in said tubular member so that the outer end of said cutting electrode intermittently projects from and recedes within said outer end of said tubular member during the cutting whereby coagulated material adhering to said electrode is removed therefrom by a scraping action of said outer end of said tubular member.

3,884,238

APPARATUS FOR INTRAOCULAR SURGERY

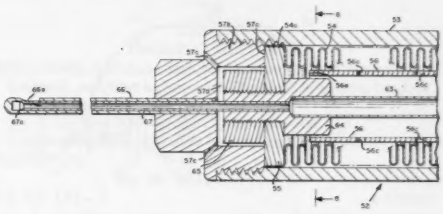
Conor C. O'Malley, 1323 Gleneyrie Dr., San Jose, Calif. 95125, and Ralph M. Heintz, Sr., 14734 Blossom Hill Rd., Los Gatos, Calif. 95030

Continuation-in-part of Ser. No. 264,166, June 19, 1972, Pat. No. 3,815,604. This application Apr. 3, 1974, Ser. No. 457,497

Int. Cl. A61b *17/32*

U.S. Cl. 128—305 **8 Claims**

2. In apparatus for intraocular surgery for cutting or severing and removal of vitreous or other material from the eyeball of a patient, the combination comprising a first tube of very small diameter having a port near one end thereof, a second tube concentric with said first tube, said tubes fitting snugly together and one of said tubes being slidable with respect to the other, the end of said second tube adjacent the port of the first tube being honed and polished to provide a sharp cutting edge, a source of vacuum, means for connecting said source of vacuum to the inner one of said tubes for drawing vitreous



into the first tube through said port, means reciprocating one of said tubes with respect to the other so that sharp end of the second tube crosses said port of the first tube and shears off said vitreous sucked into said port, a bleeder valve attached to said vacuum connecting means, said bleeder valve abolishing residual vacuum from said tubes and preventing vitreous from being drawn into said port when said reciprocating means is interrupted.

3,884,239

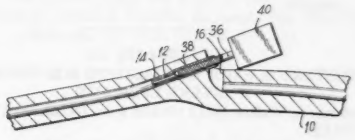
VIBRATORY MUCOSA-REMOVING TOOL

Louis Bucalo, Holbrook, N.Y., assignor to Investors In Ventures Inc., New York, N.Y.

Continuation-in-part of Ser. No. 359,429, May 11, 1973. This application Oct. 19, 1973, Ser. No. 407,990

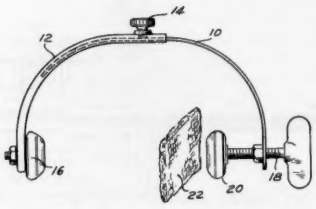
Int. Cl. A61a *17/22*

U.S. Cl. 128—304 **11 Claims**



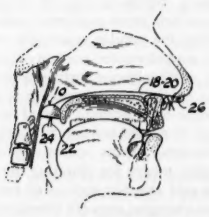
1. For use in connection with introduction of an implant into a mucosa-lined body cavity in the form of a tubular vessel, mucosa-engaging means having an elongated portion of a substantially uniform cross-sectional dimension small enough for insertion into the tubular vessel into engagement with the mucosa lining, said elongated portion of said mucosa-engaging means having at its exterior surface which is adapted to engage the mucosa lining a means for removing the mucosa lining in response to movement of said means at said exterior surface of said elongated portion with respect to the mucosa lining, and vibrating means operatively connected with said mucosa-engaging means for vibrating the latter to provide at said means at said exterior surface of said elongated portion of said mucosa-engaging means a vibratory movement derived from said vibrating means to remove with said means at said exterior surface of said elongated portion of said mucosa-engaging means a mucosa lining engaged by said means at said exterior surface of said elongated portion of said mucosa-engaging means.

3,884,240
TOURNIQUET
C. Malcolm B. Gilman, Rt. 1, Box 102, Hougbridge Rd., Colts Neck, N.J. 07722
Filed Aug. 3, 1973, Ser. No. 216,017
Int. Cl. A61b *17/12*
U.S. Cl. 128—325 **3 Claims**



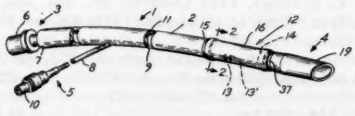
1. A tourniquet comprising:
a first curved open ended loop member of spring steel having an internal bore extending therein from one end to a point intermediate the ends, the first member having a convex outer surface and a concave inner surface;
a second curved open ended loop member of spring steel also having a convex outer surface and a concave inner surface, one end of the second member being slidable in the bore of the first member to vary the overall length of a composite loop defined by the two interconnected members, the other ends of the members being disposed opposite each other regardless of the overall length;
manually adjustable securing means attached to the first member adjacent said one end and extending radially outward from the convex surface of the first member, said means securing the two members together to establish a selected overall length;
a manually operable pressure screw extending rotatably through the other end of a selected one of the members; a first rubber pad secured to one end of said screw and disposed between the other ends of said members; and
a second rubber pad secured to the concave surface of the other member adjacent the said other end of said other member.

3,884,241
POSTERIOR PACK AND METHOD FOR TREATING SEVERE EPISTAXIS
Adrienne A. Walker, 6412 Nicklas Ave., Oklahoma City, Okla. 73132
Filed June 24, 1974, Ser. No. 482,723
Int. Cl. A61b *17/12*
U.S. Cl. 128—325 **4 Claims**



1. A posterior pack for treatment of severe epistaxis, comprising:
a resilient body adapted to occlude the choanae of a patient; and,
a pair of sutures secured, at one end portion, respectively, to said body and projecting, at their other end portions, through the nasal passages of the patient,
whereby the end portions of said sutures projecting beyond the nasal septum are tied together for maintaining said body in choanae occluded position.

3,884,242
CATHETER ASSEMBLY
Seymour Bazell, Skokie; Ralph G. Ostensen, Morton Grove; Edward M. Goldberg, Glencoe, all of Ill., and Robert D. Walker, Racine, Wis., assignors to MPC/Kurgisil, Skokie, Ill.
Continuation-in-part of Ser. No. 128,898, March 29, 1971, Pat. No. 3,734,100. This application Oct. 26, 1972, Ser. No. 301,172The portion of the term of this patent subsequent to May 22, 1990, has been disclaimed.
Int. Cl. A61m *25/00*
U.S. Cl. 128—351 **15 Claims**

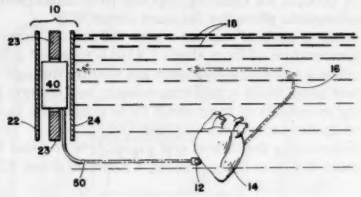


1. An improved catheter comprising:
a. a tubular, non silicone body portion having an outer surface and a central passage therein extending axially therein from a proximal to a distal end,
b. said distal end being shaped to provide a smooth gently pointed tip for ease of insertion into contact with tissues,
c. said central passage of the tubular body portion communicating with an opening in the distal end,
d. an inflation lumen disposed in association with said tube body portion,
e. a cuff assembly mounted on said tube body portion comprising:
i. a seal member to provide for sealingly engaging the cuff assembly with the outer surface of said body portion,
ii. an expansible silicone tissue-engaging cuff member defining an intracuff inflation space between said cuff and said tube outer surface,
iii. said expansible cuff portion being substantially cylindrical in its initial deflated condition and secured to said body portion by said seal member, and conforming generally to the outer surface shape of said non silicone tubular body portion in its initial deflated condition,
iv. said expansible cuff portion being composed of a low modulus silicone rubber having properties of a Shore A hardness of less than about 30, a tensile strength of below about 700 psi, an elongation of above about 1,000 percent, and a stress value upon sealing inflation of less than about 30 percent of the breaking stress of said cuff material, said properties of the silicone rubber cuff thereby resulting in pressures, at substantially complete seal, of less than vascular compressive pressures inducive of significant tissue pressure necrosis,
v. whereby said cuff upon expansion conforms to irregularities in contacted tissue surfaces and provides lateral sealing while reducing lesions.

3,884,243
IMPLANTABLE HEART PACER OR THE LIKE WITH INTERNAL CELL ELECTRODE

Jozef Cywinski, Duxbury, Mass., assignor to Corsan Engineering, Inc., Duxbury, Mass.

Filed June 15, 1973, Ser. No. 370,215
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 P **6 Claims**



1. For use in combination with a single remote unipolar implantable heart electrode, an implantable electronic pulse heart pacer device comprising

at least two electrode means of dissimilar materials spaced from one another to provide an electrolyte-containing space therebetween for cooperating with electrolyte therein to produce a cell voltage

insulation means mounting at least one of said electrode means so that its surface is exposed only to said electrolyte-containing space within the outer periphery thereof and is free from exposure on an external surface of said device to prevent direct contact of said one electrode with body tissues

said electrolyte-containing space being in communication with the exterior of said device

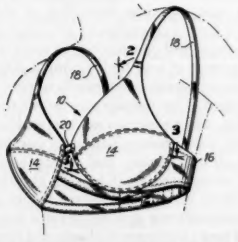
a sealed electronic pulse unit electrically insulated from said electrodes, said unit having input terminals connected to said electrode means and a single output pulse terminal for connection to said heart electrode

said electrode means providing a power source for said unit and providing an indifferent electrode for return current flow from said single remote implantable heart electrode connected to said output pulse terminal.

3,884,244
BRASSIERE FRAME

Ross F. Rowell, 5361 Belmore Ave., Montreal, Quebec, Canada

Filed Jan. 4, 1974, Ser. No. 430,678
Int. Cl. A41c *1/14, 1/20*
U.S. Cl. 128—476 **3 Claims**



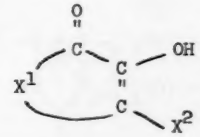
1. A frame adapted for use in a breast supporting cup of a brassiere-like garment comprising a substantially U-shape wire-like frame of generally flat rectangular cross-section throughout substantially the entire length of said frame and having inner and outer peripheral edges and inner and outer flat surface portions; said frame having a central portion and a pair of leg portions extending upwardly of the side portions of said breast supporting cup; said inner and outer flat surface portions being of tapering conical formation in that said inner peripheral edge is generally angularly offset from said outer peripheral edge and provides a dished-out overall contour which conforms to the body contours of a breast and extends for the entire length of said frame; and said leg portions being easily opened and deformable outwardly from each other by normal body movement, during breathing and articulation, and being stiffened from further separation movement by the general flattening out of the tapered conical surface portions.

3,884,245
SMOKING MIXTURES

Robert Craig Anderson, and Alan Calder, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 22, 1972, Ser. No. 308,743
Claims priority, application United Kingdom, Dec. 15, 1971, 58230/71
Int. Cl. A24b *15/00, 15/04*
U.S. Cl. 131—2 **6 Claims**

1. A smoking mixture comprising a thermally degraded carbohydrate tobacco substitute and, as a flavourant, a compound of the formula

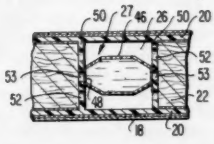


wherein X^1 represents the atoms necessary to complete a carbocyclic or heterocyclic ring of 5 or 6 carbon atoms and X^2 represents an alkyl radical preferably of 1 to 4 carbon atoms said thermally degraded carbohydrate being obtained by subjecting a carbohydrate material to a catalysed degradation process at a temperature of at least 100°C until the weight of the degraded material is approximately 90 percent or less of the dry weight of the original carbohydrate.

3,884,246
OPTIONAL DRY OR LIQUID FILTER

Eric E. Walker, 1108 N.E. 16th St., Ft. Lauderdale, Fla. 33304

Filed Jan. 16, 1973, Ser. No. 324,123
Int. Cl. A24b *15/02*
U.S. Cl. 131—10.1 **17 Claims**



1. A tobacco smoke filter element comprising:

a resilient, water impervious elongated tubular casing having a porous plug of filtering material disposed in each end of said casing;

opposed, mutually spaced, disc-like walls disposed within said casing between said plugs one wall abutting the inner surface of each plug, said walls defining a chamber within the central portion of said casing and having at least one port in each wall;

at least one liquid containing module disposed within said chamber and extending between said walls, said module configured to define with the ports in said walls at least one passage for smoke through said filter element;

means carried by said element and cooperating between said module and at least one port in each of said walls for directing liquid from said module through the ports into said plugs responsive to compression of the external walls of said chamber so that said plugs may act selectively as a dry filter or, when said casing is compressed, as a filter moistened by said liquid.

3,884,247

TOBACCO COMPOSITIONS EMPLOYING FLAVORING AGENTS COMPRISING UNSATURATED BUTYROLACTONE DERIVATIVES AND PRECURSORS THEREOF

Paul Dietrich, and Erling Sundt, both of Geneva, Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

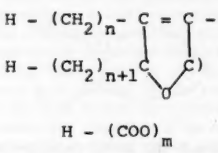
Division of Ser. No. 115,122, Feb. 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 768,896, Oct. 18, 1968, abandoned. This application Dec. 4, 1972, Ser. No. 312,031

Claims priority, application Switzerland, Oct. 18, 1967, 14559/67; Oct. 12, 1968, 15181/68

Int. Cl. A24b *15/04*

U.S. Cl. 131—17 R **5 Claims**

1. A tobacco product having added thereto a small but effective amount of at least one flavoring compound of the formula



where *n* and *m* can be 0 or 1.

3,884,248

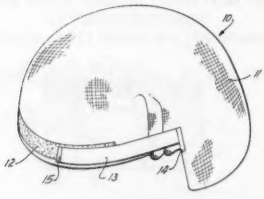
ADJUSTABLE WIGS

George R. Mendelson, Miami Beach, and Isaura A. Garcia, Miami, both of Fla., assignors to Revlon, Inc., New York, N.Y.

Filed Nov. 19, 1971, Ser. No. 200,427

Int. Cl. A45d *3/00*

U.S. Cl. 132—53 **2 Claims**



1. Means for reducing the size of a wig cap in combination with a stretch foundation fitting on the head, said means comprising a pair of fastener bands which are attached in linear relationship to the stretch foundation, one of said fastener bands being in a fixed position and the second being attached only at its end furthest from the fastener band that is in the fixed position, said second band being constructed of elastic material and so positioned that its free end may be pulled over the fixed fastener band, the exposed surface of the fixed band and the surface of the free end of the second fastener band being provided with mating strips of woven tape fasteners, one of said strips having stiff hooks and the other soft loops.

3,884,249

PROCESS FOR CLEANING HALOPHOSPHATE FURNACES

John L. Kelly, Jr., Towanda, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 299,301, Oct. 20, 1972, abandoned. This application Sept. 9, 1974, Ser. No. 504,548

Int. Cl. B08b *5/00*

U.S. Cl. 134—2 **3 Claims**

1. A process for cleaning deposits from atmospheric-tight halosphosphate phosphor furnaces comprising:

a. heating each of various zones within said furnace to a temperature of from about 1,450° F to about 2,300° F;

b. passing a nitrogen-hydrogen gas mixture through each of said zones while at said temperature, said mixture consisting essentially of from about 10 to about 60% by volume of hydrogen, balance nitrogen and

c. maintaining the flow of said gas mixture and said temperature for from at least about 4 hours to about 72 hours.

3,884,250

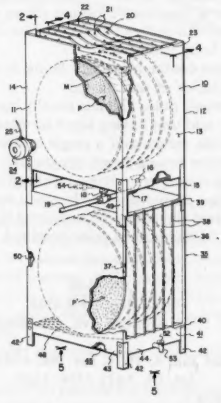
CLEANING STRUCTURE FOR REVOLVABLE PADS OF FLOOR MAINTENANCE EQUIPMENT

Merrill P. Beesley, 50 East 300 North, Salt Lake City, Utah 84054

Filed Aug. 2, 1973, Ser. No. 384,967

Int. Cl. B08b *3/04*

U.S. Cl. 134—88 **1 Claim**

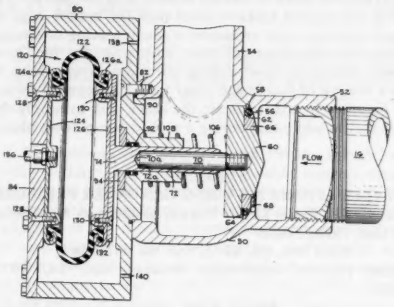


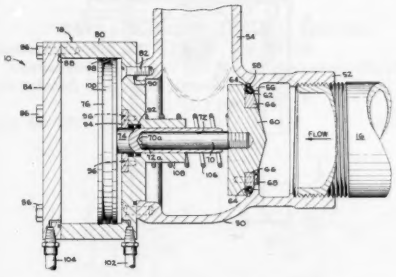
1. Apparatus for washing the pads of floor maintenance equipment, said apparatus including, in combination, a rectangular tank having an enclosure provided with a bottom, four vertical corners, and constructed to receive a cleaning liquid, a selected corner of said tank having a diagonal corner partition and a cross partition essentially normal thereto and defining an inverted U air passageway terminating in a bottom air outlet orifice, and a plate sealed over said corner partition and spaced from said cross partition to complete medially such inverted U air passageway, said passageway including upward initial and downward final legs, a plurality of horizontally spaced, vertical partitions disposed within said enclosure and defining pad-receiving spaces, aerator means, coupled to a side of said tank proximate said selected corner and communicating with said passageway at said initial leg, to introduce pressured air proximate the bottom of said tank at said downward leg, for producing air-bubble turbulence within said tank at said pad-receiving spaces to thereby maintain in solution and suspension any cleaning agent and particulate matter in said liquid, and means for draining liquid from said tank coupled thereto.

3,884,251
CYLINDER-OPERATED VALVE

Houston W. Knight, Whittier, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed May 2, 1974, Ser. No. 466,443
Int. Cl. B67c *3/00*; **B67d** *5/00*
U.S. Cl. 137—615 **9 Claims**





1. In a fluid loading arm including at least one fluid product conduit connected to at least one pipe swivel joint for pivotal movement about the axis through said swivel joint, and a fluid pressure operated valve interconnected with the fluid product conduit in a position to control product flow therethrough, said valve including a valve body and a valve closure element secured to a valve stem for controlling flow through said valve body, the improvement comprising

a. a fluid pressure responsive force means for operating said valve closure element, said force means comprising

1. a housing forming a portion of said valve body,

2. a piston rod slidably mounted in a wall of said housing and extending into said valve body towards said valve closure element, said piston rod having a longitudinal bore into which said valve stem slidably extends,

3. spring means surrounding said piston rod and said valve stem, said spring means extending between said valve closure element and said housing, said spring means biasing said element towards a position precluding flow through said valve, and

4. means for transmitting fluid pressure to said piston rod to cause said rod to move toward said valve closure element, and

b. fluid pressure means to operate said fluid pressure responsive force means and cause movement of said valve closure element into a bubble-tight seal with said valve body regardless of the pressure existent in said fluid product conduit.

3,884,252
FRICTION REDUCTION

Vitold R. Kruka, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

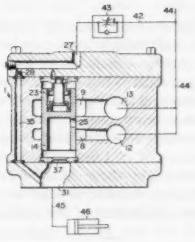
Filed June 20, 1973, Ser. No. 371,781
Int. Cl. F16d *1/16*
U.S. Cl. 137—13 **8 Claims**

1. A process for continuously providing a source of dissolved polymer in a pipeline containing a flowing hydrocarbon comprising preparing polymer crumb by stripping solvent from a polymer cement and injecting said polymer crumb into the flowing hydrocarbon.

3,884,253
HYDRAULIC CONTROL VALVE

Hikaru Murata; Yasuji Umeda; Yasusada Sakurai, and Yasuo Doi, all of Kamo, Japan, assignors to Kayabakogyokabushikikaisha, Tokyo, Japan

Filed Dec. 29, 1972, Ser. No. 319,306
Claims priority, application Japan, Dec. 29, 1971, 46-32331; Feb. 18, 1972, 47-16452; Feb. 26, 1972, 47-20021
Int. Cl. G05d *7/01*
U.S. Cl. 137—110 **13 Claims**



13. A hydraulic control valve, comprising

a valve body having a cylindrical valve chamber;

port means communicating with said valve chamber and defining a path for a main fluid flow which passes through said valve chamber and through one end thereof;

a hollow valve spool received in said valve chamber and slidable therein between positions in which it completes and interrupts said main fluid flow path;

a passage defining a pilot fluid flow path which bypasses said valve chamber;

restricted orifice means interposed in said pilot fluid flow path;

restricted orifice means in said main fluid flow path located at said one end of said valve chamber; and

conduit means for joining the fluid flow of said pilot fluid flow and the fluid flow of said main fluid flow adjacent said restricted orifice means for said main fluid flow path, for controlling the displacement of said valve spool and the volumetric flow of fluid in the main fluid flow path as a function of the difference between the pressure drops which occur in the fluid flows across said restricted orifice means.

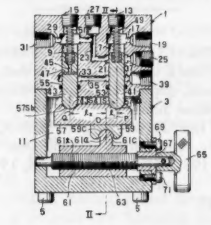
3,884,254
REDUCING VALVE

Tsuneo Kogure, Kawasaki, Japan, assignor to Amada Company, Ltd., Isehara-shi, Japan

Filed Nov. 28, 1973, Ser. No. 419,810
Claims priority, application Japan, Nov. 30, 1972, 47-119379
Int. Cl. G05d *11/02*
U.S. Cl. 137—102 **5 Claims**

1. A proportional reducing valve comprising: a housing having first and second parallel bores, each being closed at

one end and in communication at the opposite end with a housing chamber, said first bore also being in communication with an inlet in the housing wall for receiving hydraulic fluid at a primary pressure; first intermediate passageway means connecting said first bore to said second bore, said second bore also being in communication with an outlet in the housing wall through which hydraulic fluid at a secondary pressure may exit; second intermediate passageway means for connecting said second bore to a drain outlet in the housing wall; valve means for controlling fluid flow through said first and second passageway means; said valve means including first and second valve members reciprocally contained respectively in said first and second bores; a lever member mounted in said chamber for pivotal movement about a pivot point which lies on a reference line located between and parallel to the axes of said parallel bores; and resilient means in said bores for urging said valve members into contact with said lever member, whereupon pivotal movement of said lever member in response to axial movement of said first valve member as a result of force exerted thereon by the primary fluid pressure will produce opposite axial movement of said second valve member and a proportional adjustment of the secondary fluid pressure.



3,884,255

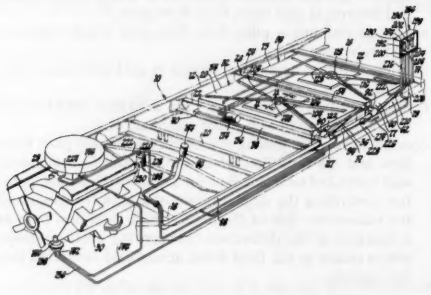
DUAL TANK FUEL SYSTEM

Ralph H. Merkle, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 30, 1973, Ser. No. 355,578

Int. Cl. B60r *27/00*

U.S. Cl. 137—265 **5 Claims**



1. A vehicle fuel supply system comprising: separate first and second tanks each having a bottom and side walls, a fuel opening in one side wall of each tank, a single fuel filler neck for receiving fuel to be supplied to the said first and second tanks, a fuel filler pipe connected to said neck having first and second branches thereon connected by a crossover segment, said branches connected to said fuel openings in said first and second tanks for filling said tanks concurrently from said single fuel filler neck, first and second fuel suction lines located respectively within said first and second tanks each of said suction lines having an inlet opening at the tank bottom for directing fuel therefrom, a fuel pump for supplying fuel to a vehicle carburetor system including an inlet and an outlet, control means for selectively communicating one of said first and second suction lines in one of the tanks to said pump during a first pump-down phase, said crossover segment directing fuel from the other of the tanks to the one tank during the first pump-down phase whereby fuel level in each of said first and second tanks is lowered equally until the fuel level in said first and second tanks is lower than the bottom edge of said fuel openings, said crossover segment serving to disconnect the one tank from the other tank when the fuel level reaches a minimum level during the pump-down phase to retain a reserve of fuel in the other tank, said control means being operable to communicate the other tank to supply the reserve fuel to said pump during a second pump-down phase.

3,884,256

PORTABLE APPARATUS USING GAS UNDER PRESSURE

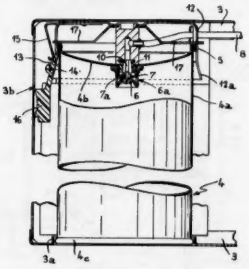
Gabriel Corlet, Genis Laval, France, assignor to Application des Gaz, Paris, France

Filed Nov. 16, 1973, Ser. No. 416,436

Claims priority, application France, Nov. 24, 1972, 72.42501

Int. Cl. F23q *3/00*

U.S. Cl. 137—322 **7 Claims**



1. Portable apparatus including a casing having a blind ended recess shaped to receive a cartridge, said cartridge having a cylindrical wall closed at each of its two ends by a cover secured to the wall by an annular radially saliant rim and containing pressurized gas, and the cartridge having in one of said covers a central gas outlet closed by a check valve member openable by displacement of the valve member in the cartridge, the apparatus further having in the blind end of said recess a gas take-off head including an annular packing and a central finger coaxially surrounded by this packing, the head being located to register with the cartridge when the latter is tightly applied so as to press said gas outlet against said packing and insert said central finger through said outlet to displace said check valve member incident to the gas-tight connection of the cartridge with the apparatus, the invention comprising the following further improvements:

a radially movable latch and spring means urging the latch inwardly, the latch being located so as to be radially pushed away by said rim when the cartridge is axially inserted into said recess, but being returned by the spring means to lock the cartridge automatically and positively behind said rim when the cartridge reaches its position of gas-tight connection with the gas take-off head;

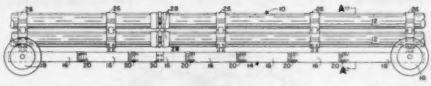
guiding and axial positioning means coacting with the cartridge when introduced in said recess to guide it automatically into locking relation with said latch and to retain it against retreat in a direction diametrically opposed to the location of said latch means; and

manual release means operatively coupled with said latch and spring means and actuatable to unlatch the cartridge from its gas-tight connection in the apparatus.

3,884,257
LINKAGE CONNECTION FOR A HOSE HAULING VEHICLE

William T. Sweeney, and Gary R. Harris, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Apr. 15, 1974, Ser. No. 460,851
Int. Cl. F16l *25/00, 11/04*
U.S. Cl. 137—355.16 **2 Claims**

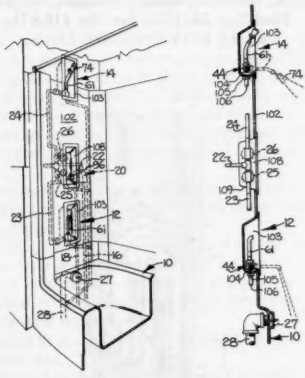


1. In a system comprising a flexible tubular means for conveying a slurry, a plurality of moveable support means to support said tubular means, a linkage means interconnecting said moveable support means, said linkage means comprising a plurality of link members having connecting means at each end and pivotally connected together and to said support members and means for securing said tubular means to said linkage means, an improvement comprising positioning in said linkage means at least one link member having a union means for breaking and rejoining said linkage means positioned between a first and a second end of said link member.

3,884,258
RETRACTABLE BATHROOM FIXTURE

Leonard E. Mull, Rt. 3, Clover, S.C. 29710

Continuation-in-part of Ser. No. 279,663, Aug. 10, 1972, abandoned. This application Dec. 6, 1973, Ser. No. 422,274
Int. Cl. F16k *11/10*
U.S. Cl. 137—360 **8 Claims**



1. A bathroom fixture assembly having provision for selectively delivering water to a bathtub, shower, or the like at two separate spaced locations and at a predetermined temperature, and comprising

a shower head comprising

a. a tubular member comprising a peripheral wall defining an internal passageway and an outer cylindrical surface, and an outlet opening extending radially through said peripheral wall and communicating with said internal passageway,

b. delivery spout means carried by said tubular member and comprising a tubular sleeve surrounding said tubular member and including a peripheral wall defining an inner cylindrical surface coaxially disposed about and closely overlying said outer cylindrical surface of said tubular member, an outlet opening extending radially through said sleeve wall, and a radially directed delivery spout fixedly connected to said tubular sleeve and communicating with said sleeve outlet opening, whereby said delivery spout means may be selectively rotated about said tubular member between a first position wherein said sleeve outlet opening is aligned with said tubular member outlet opening to permit passage of water therethrough and a second position wherein said sleeve inner surface overlies said tubular member outlet opening to preclude passage of water therethrough, and

a tub faucet comprising

a. a tubular member comprising a peripheral wall defining an internal passageway and an outer cylindrical surface, and an outlet opening extending radially through said peripheral wall and communicating with said internal passageway,

b. delivery spout means carried by said tubular member and comprising a tubular sleeve surrounding said tubular member and including a peripheral wall defining an inner cylindrical surface coaxially disposed about and closely overlying said outer cylindrical surface of said tubular member, an outlet opening extending radially through said sleeve wall, and a radially directed delivery spout fixedly connected to said tubular sleeve and communicating with said sleeve outlet opening, whereby said delivery spout means may be selectively rotated about said tubular member between a first position wherein said sleeve outlet opening is aligned with said tubular member outlet opening to permit passage of water therethrough and a second position wherein said sleeve inner surface overlies said tubular member outlet opening to preclude passage of water therethrough,

temperature control means for receiving predetermined relative quantities of water from a hot and cold water line and for delivering such water into said internal passageway of each of said shower head and tub faucet, said temperature control means including means for manually adjusting the relative quantities of water received from said hot and cold water lines to thereby permit the user to adjust the temperature of the water delivered from said delivery spout means of either said shower head or tub faucet, and temperature responsive means for automatically adjusting the relative quantities of water received from the hot and cold water lines so as to maintain a preselected temperature for the water delivered from said delivery spout means regardless of a change in pressure in one of the hot and cold water lines, and

receptacle means for mounting each of said shower head and tub faucet within a wall such that said delivery spout of said shower and tub faucet does not protrude beyond the front surface of the wall when such delivery spout means is in said second position.

3,884,259
THREE-WAY VALVE FOR CONTROLLING THE FLOW OF FLUIDS AT CRYOGENIC TEMPERATURE AND AT WIDELY DIFFERENT PRESSURES

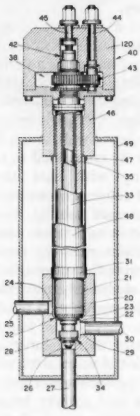
Thomas P. Hosmer, Concord, and Robert W. Johnson, Holbrook, both of Mass., assignors to Cryogenic Technology Inc., Waltham, Mass.

Filed Jan. 21, 1974, Ser. No. 434,984
Int. Cl. F16k *1/04, 11/20*
U.S. Cl. 137—375 **17 Claims**

1. A three-way fluid-flow control valve adapted to provide controllable fluid communication between zones of different fluid pressures, comprising in combination

a. a valve body having defined therein a first chamber and a second chamber, said first chamber having a diameter larger than that of said second chamber and being joined thereto by a frustoconically-configured shoulder defining a first sealing surface;

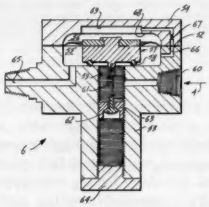
b. a first fluid port opening into said first chamber of said valve body;
c. a second fluid port communicating with said second chamber of said valve body through a frustoconically-configured shoulder defining a second sealing surface;
d. a third fluid port opening into said second chamber of said valve body;
e. outer valve stem means terminating within said valve body in a first sealing member configured to make an essentially line sealing contact with said first sealing surface thereby to controllably isolate said first chamber from said second chamber;
f. inner valve stem means extending through and coaxial with said outer valve steam means and defining therewith an annular fluid passage continuously in fluid communi-



cation with said third fluid port, said inner valve stem means terminating within said valve body in a second sealing member configured to make an essentially line sealing contact with said second sealing surface thereby to controllably isolate said second chamber from said second fluid port;
g. first drive means including first screw means adapted to impart axial motion to said outer valve stem means;
h. second drive means including second screw means adapted to impart axial motion to said inner valve stem means independent of said first drive means;
i. housing means defining fluid-tight screw chamber means around said first and second screw means; and
j. fluid passage means providing fluid communication between said first chamber in said valve body and said screw chamber means.

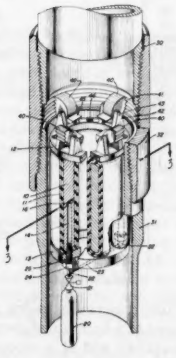
3,884,260
DIAPHRAGM VALVE APPARATUS AND CONTROL SYSTEMS EMPLOYING SUCH VALVE APPARATUS
Adolph J. Hilgert, Mequon, Wis., assignor to Johnson Service Company, Milwaukee, Wis.
Division of Ser. No. 222,603, Feb. 1, 1972, abandoned. This application Oct. 9, 1973, Ser. No. 404,646
Int. Cl. G05d *16/02;* **F16k** *17/06*
U.S. Cl. 137—469 **6 Claims**

1. A diaphragm valve apparatus for establishing a regulated pressure in a pressure line comprising a valve body having a pair of chambers separated by a common flexible diaphragm member, an inlet passageway means terminating in a first of said pair of chambers and having means adapted to be connected to the pressure line, a control passageway means connecting said first chamber to said second chamber, said diaphragm member having a valve means associated with said inlet passageway means and adapted to open and close said inlet passageway means, said diaphragm member resiliently holding the valve means to close said inlet passageway means and responsive to a preselected inlet pressure in said inlet passageway means to move said diaphragm member and said valve means to transmit pressure through said control passageway means between the first and the second of said pair of chambers, said valve means includes a seal valve element coaxially encircling the inlet passageway and adapted to be



moved between sealing engagement with the adjacent surface of the inlet passageway and spaced therefrom, said valve means being held partially open to produce a pressure drop across said valve means and thereby establishing a regulated pressure in said line, an exhaust passageway connected to said first chamber, said control passageway providing direct connection between said first chamber and said second chamber and including a flow restriction means to prevent chatter movement of the valve element.

3,884,261
REMOTELY ACTIVATED VALVE
Frank Clynch, 14010 Taylorcrest, Houston, Tex. 77024
Filed Nov. 26, 1973, Ser. No. 418,971
Int. Cl. E21b *33/10;* **F16l** *55/12*
U.S. Cl. 137—488 **12 Claims**



1. A valve for a pipe comprising:
a. first and second semicylindrical portions;
b. first and second flexible envelopes enclosing said first and second semicylindrical portions;
c. means for rigidly mounting said semicylindrical portions in a generally cylindrical configuration defining first and second ends;
d. means attached to one end for retaining said cylindrical configuration in a fixed position in said pipe; and
e. means for filling the space between said first and second semicylindrical portions and associated rubber envelope

with a compressed fluid to expand said envelopes into a pipe closing position.

3,884,262

PRESSURE CONTROL DEVICE FOR A HYDRAULIC CIRCUIT

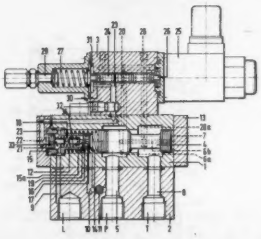
Carl J. Assembergs, Alzano Lombardo, Italy, assignor to Koppen & Lethem Trading Co. A.G., Zug, Switzerland

Continuation of Ser. No. 178,200, Sept. 7, 1971, abandoned. This application July 11, 1973, Ser. No. 378,078

Claims priority, application Netherlands, Sept. 11, 1970, 7013477

Int. Cl. F16k *17/06*

U.S. Cl. 137—489 **11 Claims**



11. In a pressure-control device for selectively setting a maximum operating pressure in a hydraulic circuit in which said device includes:

a pressure balance valve, having a pressure-balance slide controlling a throttle passage interconnecting a pump channel and a return channel to the reservoir for said pump, said slide being moved to open said passage by balance pressure at one end thereof, and a pressure-limiting valve assembly, having a control plunger pressurized at one end thereof by an electrically reduced pressure fed through a control bore, said plunger being moved to open an auxilliary bore for lowering said balance pressure when said electrically reduced pressure is insufficient,

the improvement comprising the formation of said electrically reduced pressure in said control bore by movement of a two-way control slide which:

A. operates between a feed bore, said control bore, and a return bore to said reservoir by means of an electric magnet moving an armature in response to a selected electrical current, said control bore having no other outlet than said return bore;

B. is loaded at one end thereof by said electrically reduced pressure; and

C. is attached at the other end thereof to said armature.

3,884,263

DISHWASHING MACHINE

Kenneth F. A. Wright, 1030 W. 49th, Vancouver, British Columbia, Canada

Filed Sept. 14, 1973, Ser. No. 397,289

Int. Cl. B08b *3/00;* **F16k** *11/02*

U.S. Cl. 137—571 **14 Claims**

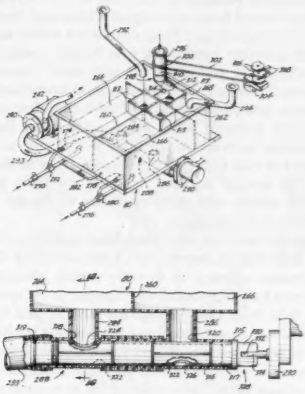
1. In a dishwashing machine having a washing zone, a loading zone and an unloading zone, water holding and supply apparatus comprising:

a first tank means for holding wash water located below said washing zone,

a second tank means for holding rinse water located below said washing zone,

drain means associated with said tank means and located below said washing zone,

first conduit means for supplying water from said first and second tank means to said washing zone and valve means in said conduit means selectively operable to place said conduit means in fluid communication with one of said tank means,



second conduit means operatively coupled to said washing zone for draining said washing zone of water supplied thereto, and

means operatively coupled to said second conduit means for selectively directing said water from said washing zone to one of said first tank means, said second tank means, and said drain means.

3,884,264

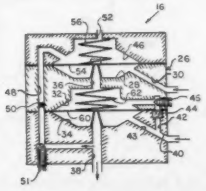
CONDITION SENSING APPARATUS AND VALVE THEREFOR

Bryan J. Hunter, Boulder, Colo., assignor to E. F. Industries, Inc., Louisville, Colo.

Division of Ser. No. 217,777, Jan. 14, 1972, Pat. No. 3,777,698. This application Sept. 19, 1973, Ser. No. 398,640

Int. Cl. G01f *23/00*

U.S. Cl. 137—624.14 **14 Claims**



1. A fluid operated valve assembly, comprising:

a. a housing including

1. a first chamber having first input means adapted to receive a fluid input signal and direct said fluid input signal into said first chamber,

2. a second chamber constructed to be disposed in fluid commmunication with said first chamber and having second input means adapted to receive a supply of pressurized fluid and direct said pressurized fluid into said second chamber,

3. a third chamber having third input means adapted to receive a supply of pressurized fluid and direct said pressurized fluid into said third chamber, and

4. a passage constructed to be disposed in fluid communication with and leading away from said third chamber;

b. first closure means mounted within said housing and movable between a first biased position for fluid sealing said first chamber from said second chamber and a second position for allowing fluid communication between said first and second chambers, said first closure means being adapted to move from its first position to its second position in response to and during the presence of said fluid input signal within said first chamber;

c. a second closure means mounted within said housing and movable between a first biased position for fluid sealing said passage from said third chamber and a second position for allowing fluid communication between said passage and said third chamber, said second closure member being adapated to move from its first position to its second position in response to the movement of said first closure member from its first position to its second position whereby to allow pressurized fluid within said third chamber to escape therefrom through said passage; and

d. a fourth chamber separated from said first chamber by said first closure means, said valve assembly also including means adapted to directly supply pressurized fluid into said fourth chamber in response to escaping pressurized fluid from said passage for moving said first closure means from its second position to its first position regardless of the presence of said input signal within said first chamber whereby to cause said second closure means to move back to its first position from its second position for fluid sealing between said passage and said third chamber.

3,884,265

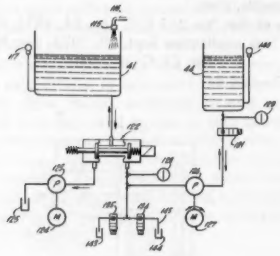
DECONTAMINATION APPARATUS

Jack E. Fry, Dallas; Joseph C. Gerard, Arlington; Chester C. Hickman, and John E. Hummel, both of Dallas, all of Tex., assignors to Arbrook, Inc., Arlington, Tex.

Division of Ser. No. 49,407, June 24, 1970, Pat. No. 3,739,791. This application Oct. 20, 1972, Ser. No. 299,528

Int. Cl. B08b *3/06*

U.S. Cl. 137—565 **1 Claim**



1. Washing and disinfecting apparatus comprising a washing and disinfecting tub, a storage tank for liquid disinfectant, a diverter valve connecting said tub either to a drainage system having means for removing washing and rinsing liquids or to said storage tank through a disinfectant piping system, said piping system having a reversible pump for transferring said disinfectant liquid back and forth between said storage tank and said tub, and first and second fluid level responsive means for rendering said pump inoperative as soon as the level of the disinfectant liquid drops below a predetermined point relative to said tank with respect to said first means and relative to said diverter valve with respect to said second means, and for again rendering said pump operative when even a small amount of said disinfectant brings the disinfectant level above the predetermined point with respect to said first means when the disinfectant is being transferred from said tub to said tank and above the predetermined point with respect to said second means when the fluid is being transferred from said tank to said tub.

3,884,266

DIRECTIONAL-CONTROL VALVE

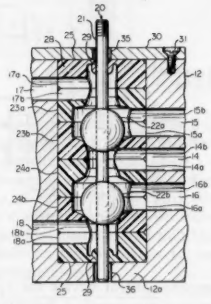
Shigeji Kondo, 5-1 Sakuma Takeya-cho, Gamagori-shi, Aichi-ken, Japan

Filed Apr. 12, 1973, Ser. No. 350,374

Claims priority, application Japan, Apr. 17, 1972, 47-37748

Int. Cl. F16k *11/00*

U.S. Cl. 137—625.27 **9 Claims**



1. A directional-control valve for fluid-power systems, comprising:

a valve-body having a cylindrical valve chamber and a plurality of flow-passages connected to said chamber, said flow-passages having ports at said chamber which are arranged at different axial positions with respect to the axis of said chamber;

a plurality of pairs of valve-seat members disposed in said chamber, coaxial therewith, said valve-seat members being made of resilient material and each having an annular wall portion and a seat portion formed at the inner side of said wall portion, said wall portion being in close contact at its outer peripheral surface with the inner surface of the valve-body;

a poppet-spool positioned in said chamber and coaxial with said pairs of valve-seat members and including a rod and a plurality of poppets secured to said rod, each of said poppets being arranged between the seat portions of a separate pair of valve-seat members, and

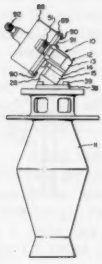
a pair of members disposed in said chamber at the opposite ends thereof for slidably supporting said poppet spool for axial movement, said support members being made of resilient material and each having an outer annular wall portion and an annular supporting portion formed inwardly of said outer wall portion, said outer wall portion being in close contact at its outer peripheral surface with the inner surface of the valve-body and said supporting portion being in close contact at its inner peripheral surface with the peripheral surface of said rod of the poppet-spool;

said valve-seat members and support members being supported in their positions in contact with each other at the end surfaces of their wall portions and being formed on the end surfaces of their wall portions with radially extending grooves forming flow-ports aligned with said flow-passages of the valve-body for connecting said flow-passages to the chamber.

3,884,267
DIRECT-ACTING TWO-WAY CONTROL VALVE

George F. Grouwinkel, Manhatten Beach, and James W. Hager, San Marino, both of Calif., assignors to Moog Inc., East Aurora, N.Y.

Filed Oct. 18, 1973, Ser. No. 407,517
Int. Cl. F16k *1/32*
U.S. Cl. 137—625.33 5 Claims



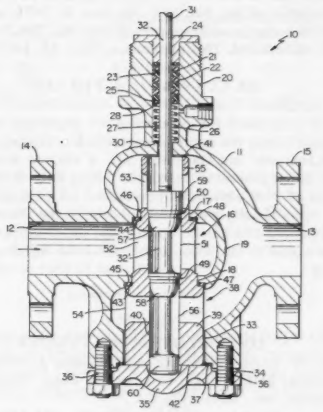
1. In a direct-acting two-way control valve, the combination comprising valve body means having first and second seats and fluid inlet and outlet chambers, poppet-type valve closure means including a first part engaging said first seat and a second part engaging said second seat, and electromagnetic actuation means for unseating said closure means, relative movement between said first part and first seat providing a first variable annular orifice having an upstream outer side and a downstream inner side, relative movement between said second part and second seat providing a second variable annular orifice having an upstream inner side and a downstream outer side, said inlet chamber communicating with said upstream outer side of said first orifice, said closure means having an internal passage establishing communication between said inlet chamber and said upstream inner side of said second orifice, said outlet chamber communicating with said downstream side of each said orifice, said body means including first, second and third body sections, said first and second sections having opposing contacting flat surfaces coplanar with the plane of sealing between said first part and first seat, and said second and third sections having opposing contacting flat surfaces coplanar with the plane of sealing between said second part and second seat.

3,884,268
VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Joseph P. Wagner, Knoxville, and Ronnie C. Jenkins, Sevierville, both of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 25, 1974, Ser. No. 436,517
Int. Cl. F16k *27/04*, *3/316*
U.S. Cl. 137—625.36 12 Claims

1. A valve construction comprising a valve body having an inlet and an outlet interconnected together by a chamber of said valve body, a one-piece valve seat cage disposed in said chamber and having valve seat means disposed between said inlet and said outlet, said cage having integral guides disposed on opposite sides of said valve seat means, a valve stem means movably guided by said guides and having valve member means for cooperating with said valve seat means to open and close the same, said valve body having an opening therein leading to said chamber, said valve seat cage being insertable through said opening into said chamber and being removable from said chamber out through said opening, and a cover member detachably secured to said valve body to close said opening, said valve body being one-piece and having a bonnet

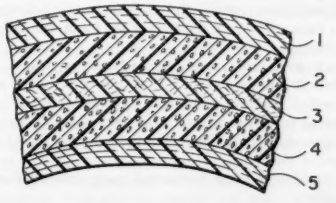


formed integrally therewith in aligned relation to said opening and on the opposed side of said valve body from said opening.

3,884,269
FIBER-REINFORCED FLEXIBLE PLASTIC PIPE

Rudolf Schetty, Riehen, and Borge Ingmar Carlstrom, Nitorp, Hoganas, both of Sweden, assignors to Basler Stuckfarbere AG, Switzerland

Continuation of Ser. No. 70,693, Sept. 10, 1970, abandoned. This application Sept. 14, 1972, Ser. No. 291,691
Claims priority, application Switzerland, Sept. 12, 1969, 13869/69; Sweden, Nov. 28, 1969, 16452/69
Int. Cl. F16l *11/08*
U.S. Cl. 138—137 15 Claims



1. A fiber reinforced cylindrical flexible plastic pipe, comprising a wall formed of a plurality of layers bonded together, at least one of all layers comprising a plastic-bound granulated material layer, and at least one outer and one inner fiber-reinforced layer having fibers of approximately 40 mm in length, all of which are disposed in a curved circumferentially extending orientation throughout the layer thickness.

3,884,270

METHOD FOR PRODUCING FLEXIBLE REGENERATED CELLULOSIC TUBING AND THE TUBING OBTAINED THEREFROM

Jerome Jordan Michael Rasmussen, South Stickney Twp., and David Vou, Park Forest, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 337,109, March 1, 1973, which is a continuation of Ser. No. 197,158, Nov. 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 789,350, Jan. 6, 1969, abandoned. This application Mar. 14, 1974, Ser. No. 451,114

Int. Cl. C08b *21/20*; F16l *11/02*

U.S. Cl. 138—177 3 Claims

1. In a method for producing an improved regenerated cellulosic tubing the improvement which comprises the step of homogeneously incorporating into a viscose solution from which the regenerated cellulosic tubing is to be formed, an amount of from about 0.5 percent to 2.5 percent by weight based upon the dry weight of cellulose in the viscose solution of a softening anti-block additive said additive being castor oil that is added to said viscose solution in an aqueous emulsion thereof.

3,884,271

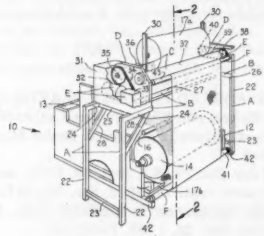
LOOM CLOTH ROLL TAKE UP

Robert W. Bond, Greenville, and William J. Alexander, III, Mauldin, both of S.C., assignors to Bond Transmission & Controls, Inc., Greenville, S.C.

Filed Apr. 23, 1973, Ser. No. 353,237

Int. Cl. D03d *49/00*, *49/20*

U.S. Cl. 139—1 R 7 Claims



1. In a cloth roll take up for a loom having a loom warp beam adjacent the rear of the loom and a cloth delivery roll mounted to receive woven cloth carried between loom side frame members adjacent the front of the loom, said take up having means for guiding the cloth from said delivery roll and thence beneath toward the rear of the loom, the improvement comprising:

A. a pair of transversely spaced vertical frame members, each including a pair of longitudinally spaced standards, carried laterally outboard independently of said loom frame members adjacent the rear of the loom;

B. a mounting platform carried by said frame members above the loom;

C. a pair of spaced horizontal transverse friction take up rolls;

D. a pair of spaced roll supports carried by said platform in transverse alignment therewith for supporting said pair of take up rolls for rotation above and in substantial vertical alignment with said loom beam;

E. means for driving said pair of take up rolls carried by said platform; and

F. means for guiding the cloth from beneath the loom substantially vertically behind the loom warp beam to the take up rolls.

3,884,272

DOUBLE-LIFT OPEN-SHED JACQUARD MACHINE

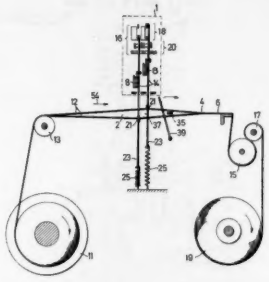
Wolfgang Brenner; Gunter Feier, and Antonius Vinnemann, all of Stuttgart, Germany, assignors to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed May 17, 1973, Ser. No. 361,035

Claims priority, application Switzerland, May 19, 1972, 7467/72

Int. Cl. D03c *3/06*

U.S. Cl. 139—59 5 Claims



1. In a double-lift open-shed jacquard machine having a pair of vertically movable draw knives for reciprocating between two reversal positions, a plurality of lifting hooks for coupling with a respective draw knife in each of the two reversal positions of said draw knives, and a stationary part having a retaining claw; a vertically disposed single lifting hook having a pair of hooks located on opposite sides for selective engagement with a respective draw knife for movement of said retaining hook vertically between a top position and a bottom position, each said hook having a depending stem, and a retaining hook for selectively engaging said claw, one of said pair of hooks being located on the same side as said retaining hook and having said stem thereof of longer length than said stem of the other of said pair of hooks.

3,884,273

DOBBY

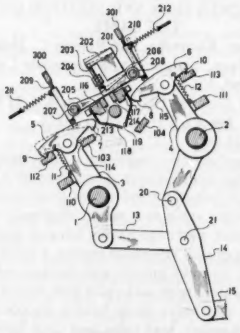
Zdenek Pavlica, Jicin, Czechoslovakia, assignor to Elitex, Zavody textilniho strojirenstvi generalni reditelstvi, Liberec, Czechoslovakia

Filed Dec. 29, 1972, Ser. No. 319,307

Claims priority, application Czechoslovakia, Jan. 4, 1972, 3372-72

Int. Cl. D03c *1/06*

U.S. Cl. 139—71 11 Claims



1. A dobby for reversibly controlling the shed wires and the associated heald during the shedding operation of a loom

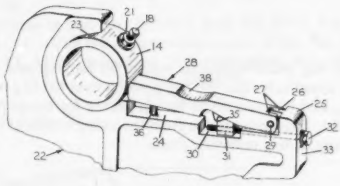
comprising a pair of lifting knives, each lifting knife being respectively supported on a carrier, a pair of fixed shafts, each of said carriers being rotatably mounted on one of said shafts, means for oscillating each of said carriers in an arcuate path about its associated shaft, a crank associated with each lifting knife, said crank being mounted freely on the associated shaft to be rotatable about a common axis and in an arcuate path in proximity to its associated carrier, means connecting each crank to the associated heald, a latch pivotally mounted at its center at the end of each crank, said latch having a hook at one end engageable with the associated lifting knife when in proximity thereto, means for normally maintaining said latch out of engagement with the associated lifting knife, and means for selectively moving one or both of said latches to engage the associated lifting knife to cause said crank to move conjointly with said carrier thereby to move said heald simultaneously with one or both of said lifting knives.

3,884,274

LOOM WARP BEAM DEVICE

Thomas Sujdak, Webster, Mass., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 9, 1974, Ser. No. 432,077
Int. Cl. D03d *49/06*
U.S. Cl. 139—97 **2 Claims**



1. For a loom having juxtaposed and axially aligned warp yarn beams from which warp yarn is drawn during weaving, an apparatus for positioning and maintaining adjacent yarn beams in axial alignment comprising:

a. a supporting shaft for each yarn beam with a coupling member for interconnecting the ends of said supporting shafts;

b. a bracket member having an integrally formed pocket for reception of said coupling member and for positioning the yarn beams in axial alignment;

c. means defining a locking lever pivotally connected to said bracket member; and

d. Cam means carried by said bracket member and operatively associated with said locking lever having manual means for selectively moving said cam means between positions for supporting and guiding said coupling member into and out of said pocket and for locking said coupling within said pocket.

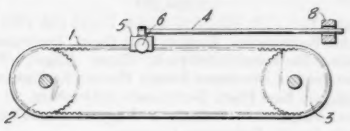
3,884,275

DEVICES FOR THE ACTUATION OF LANCES IN LOOMS WITHOUT SHUTTLES

Anselmo Bolea Camprubi, 55 Tavern St., Barcelona, Spain

Filed Nov. 9, 1973, Ser. No. 414,188
Claims priority, application Spain, Nov. 13, 1972, 185601
Int. Cl. D03d *47/00*
U.S. Cl. 139—123 **5 Claims**

1. Device for actuating lances in looms without shuttles comprising a loom frame having at least one support therein, a movement transmitting element, means for driving said movement transmitting element, a carriage attached to said movement transmitting element, said carriage includes sliding means in engagement with at least one support in said loom frame for guiding said carriage, a lance attached to said carriage so that the movement of said movement transmitting element is transferred to said lance without direct contact between said movement transmitting element and said lance, said movement transmitting element is a flexible endless belt, said means for driving said movement transmitting element comprises a pair of spaced driving wheels in engagement with the inner surface of said belt, said driving wheels are arranged



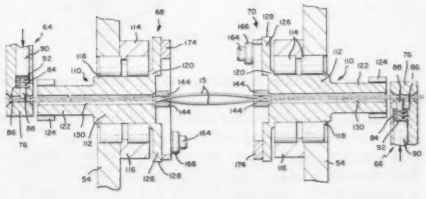
so that said flexible belt travels in a curvilinear path between said driving wheels, auxiliary support members located between said driving wheels for supporting said flexible belt in its curvilinear path, and said lance attached to said carriage is flexible so that it travels in a curvilinear path comparable to the curvilinear path of said flexible belt.

3,884,276

METHOD AND APPARATUS FOR FORMING PAIRED LEADS HAVING AN INTERMEDIATE TWISTED PORTION AND UNTWISTED END PORTIONS AND FOR APPLYING TERMINALS OR THE LIKE TO THE END PORTIONS

Daniel Eugene Poplaski, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 29, 1974, Ser. No. 474,275
Int. Cl. B21f *7/00*
U.S. Cl. 140—115 **22 Claims**



1. A method of forming a terminated pair of twisted leads from a source of twisted leads comprising the steps of:

providing a source of supply of twisted pairs of leads having a free end;

holding two spaced apart portions of the twisted paired leads between the free end and the source of supply and engaging two intermediate portions between the two held portions;

rotating the two intermediate portions in opposed directions to untwist the leads between the two intermediate portions;

feeding the untwisted leads to a cutting zone;

cutting the untwisted leads at the cutting zone to form cut trailing and leading ends, the leading ends still being interconnected with the source of supply;

transferring the leading ends to an applicator station for the application of terminals thereto and then repositioning the leading ends in alignment with the cutting zone;

holding two spaced apart portions of the twisted paired leads between the untwisted portion and the source of supply and engaging two intermediate portions between the two held portions;

rotating the two intermediate portions in opposed directions to form an additional untwisted portion;

feeding an additional untwisted portion into the cutting zone while advancing the untwisted portion which has the

terminals affixed to the leading ends through and past the cutting zone;

severing the additional untwisted portion; and

applying terminals or the like to the trailing ends of the severed additional untwisted portion.

3,884,277

APPARATUS FOR FILLING BEER CANS OR THE LIKE

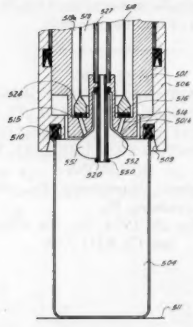
Friedrich Rademacher, Kamen; Karl Quest, Dortmund; Uwe Knabe, Dortmund-Hombruch; Dieter Unger, Waltrop; Heinz Jordan, Dortmund-Korne; Werner Heckmann, Dortmund, and Karl Plock, Dortmund-Lucklemberg, all of Germany, assignors to Holstein & Kappert Maschinenfabrik Phonix GmbH, Dortmund, Germany

Division of Ser. No. 175,673, Aug. 27, 1971, Pat. No. 3,807,463. This application Jan. 8, 1974, Ser. No. 431,725

Claims priority, application Germany, Aug. 29, 1970, 2042990

Int. Cl. B65b *31/00*

U.S. Cl. 141—59 **4 Claims**



1. In an apparatus for filling cans or analogous containers with a liquid, a filling device comprising an upright housing; an annular sealing member mounted for up-and-down movement along said housing and having in the region of its lower end annular gasket means movable into sealing engagement with the mouth of a container therebelow, said housing having a surface at the underside thereof and liquid-admitting channel means having a discharge end in said surface; an upright holder supported by and extending downwardly from said housing; and a float mounted for lengthwise movement along said holder and having an external surface which engages said surface of said housing to seal said channel means from the interior of a sealingly engaged can when said channel means has admitted such quantities of liquid that the float rises by buoyancy and moves said external surface into engagement with the surface of said housing.

3,884,278

AUTOMATIC BAG FEEDING DEVICE EQUIPPED WITH AN AUTOMATIC CHARGING DEVICE

Shigeo Nakashima, 7-7, Koaza Tenjinmori, Oaza Morimoto, Mukomachi, Kyoto, Japan

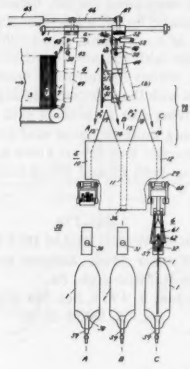
Filed Feb. 15, 1973, Ser. No. 332,731

Claims priority, application Japan, Feb. 19, 1972, 47-017326; Mar. 27, 1972, 47-030460

Int. Cl. B65b *43/18, 43/30*

U.S. Cl. 141—67 **3 Claims**

1. In an apparatus for automatically feeding bags and for charging the bags by bag charging means with a predetermined amount of material, which comprises a magazine for the bags, a bag conducting mechanism for taking successive ones of the bags from the magazine and including a plurality of bag receiving ducts for receiving the bags preparatory to charging the improvement which comprises in combination: (1) stroke means associated with said bag conducting mechanism, said stroke means disposed for reciprocal horizontal movement; (2) swing means pivotally mounted on said stroke means, said swing means having bag engaging means for selectively removing a bag from the magazine or for releasing a bag



above the bag receiving ducts, means for moving said swing means to selectively alter the bag position over the bag receiving ducts, and (3) said ducts having means for conducting a freely falling bag upon release from the swing means to one of the plurality of bag receiving ducts.

3,884,279

AUTOMATIC SAFETY DISPENSING MECHANISM FOR FLUID OR PULVERULENT MATERIAL

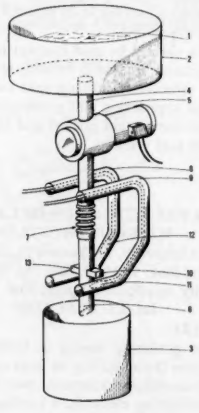
Paul Genoud, Saint Genis-Laval, and Eugene Bresson, Lyon, both of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, France

Filed Apr. 11, 1973, Ser. No. 350,206

Claims priority, application France, Apr. 14, 1972, 72.13343

Int. Cl. B65b *43/42*

U.S. Cl. 141—156 **14 Claims**



1. A safety device for transferring a fluid or pulverulent material between a first container and at least one second

container, said safety device comprising a discharge pipe for discharging material from a first container, said discharge pipe connected to said first container, obturating means for obturating said discharge pipe and for controlling the flow of material therethrough, a distributing duct for distributing said material to at least a second container when said first and second containers are in a substantially preselected relative location with respect to one another, connecting means for movably connecting said distributing duct to said discharge pipe, said connecting means enabling a relative displacement of said distributing duct with respect to said discharge pipe, detecting means for detecting the position of said distributing duct to automatically control the opening of said obturating means exclusively when said distributing duct is substantially at a predetermined reference position corresponding to said preselected relative locations of said first and second containers, said detecting means effecting control of said obturating means to transfer said material between said first and second containers when said distributing duct is substantially at said reference position and, said detecting means effecting closure of said obturating means when said distributing duct is substantially moved from said reference position.

3,884,280

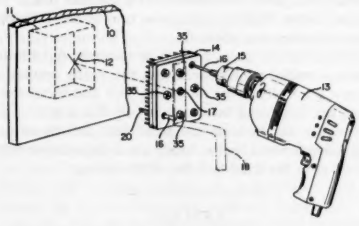
WALL OUTLET AND SWITCH BOX HOLE CUTTER

John D. Chailer, 2115 Weatherbee Ave., Fort Worth, Tex. 76110

Division of Ser. No. 291,726, Sept. 25, 1972, Pat. No. 3,833,311, which is a continuation-in-part of Ser. No. 258,081, Aug. 23, 1972, abandoned. This application Apr. 18, 1974, Ser. No. 462,093

Int. Cl. B27f *5/12*

U.S. Cl. 144—73 **15 Claims**



1. A cutting device adapted for use with a source of rotary power for cutting shaped openings in sheet material comprising a housing; an endless driven member mounted for movement within said housing, said member being provided with cutting means extending forwardly of said housing; rotatable drive means for causing movement of said member; a sight opening formed through said housing at a location corresponding to the center of the shaped opening to be cut by said device; and a plurality of idler means mounted within said housing and positioned so that said member is constrained to move along a desired closed path.

3,884,281

SALVAGE MACHINE AND HARVESTER

Lionel Pease, 2333 N.W. 98th, Seattle, Wash. 98107

Filed Aug. 11, 1969, Ser. No. 848,994

Int. Cl. B27c *1/00;* **B27l** *11/02*

U.S. Cl. 144—218 **20 Claims**

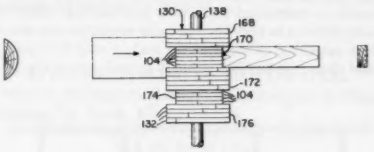
1. A chipper head assembly for rotary milling and climb cutting a piece of wood, said assembly comprising:

a. a first chipping knife;

b. a second chipping knife;

c. said first chipping knife having a radial cutting edge and an annular cutting edge for cutting on the face of the piece of wood;

d. said second chipping knife having an annular cutting edge for cutting on the face of the wood; and,



e. the annular cutting edge of the first chipping knife being on a larger radius than the annular cutting edge of the second chipping knife.

3,884,282

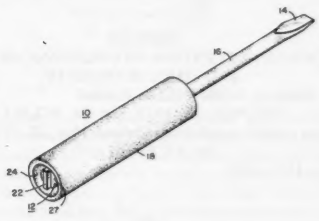
SCREWDRIVER WITH INTEGRAL MAGNETIC SCREW STARTER

Stephen Stanley Dobrosielski, 429 E. End Ave., Beaver, Pa. 15009

Filed Apr. 29, 1974, Ser. No. 464,943

Int. Cl. B25b *15/00*

U.S. Cl. 145—50 DA **7 Claims**



1. A screwdriver with integral, magnetic screw starter comprising:

an elongated handle;

a shank formed of a first material attached to and extending from one end of said elongated handle;

a first driver head formed at the free end of said shank;

an elongated magnetic screw starter, longitudinally aligned with said shank, formed of a second material having superior magnetizable properties and attached to the other end of said elongated handle opposite said shank; and,

a second driver head formed at the exposed end of said magnetic screw starter and being constructed for use in cooperation with said first driver by only accommodating the same size and type of screw as said first driver.

3,884,283

TIRE CHAIN

Stewart L. Engel, 305 S. Warminster Rd., Hatboro, Pa. 19040

Filed Dec. 5, 1973, Ser. No. 422,120

Int. Cl. B60c *27/00*

U.S. Cl. 152—213 A **5 Claims**

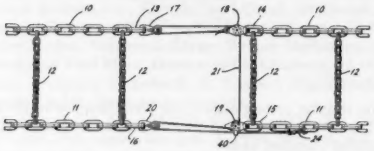
1. A tire chain, comprising two side chains adapted to be positioned in circular form at opposite sides of a tire and tread chains connecting said side chains and adapted to extend over the tread of the tire,

permanently closed-link retaining elements connected to corresponding ends of each of said side chains,

open-link retaining elements connected to the opposite ends of each of said side chains,

and a flexible cable having one end secured to the end of a first one of said side chains to which one of said closed-

link retaining elements is connected and having a snap hook connected to its other end, said cable passing through said closed-link retaining element connected to the end of said first side chain to which the end of said cable is connected to form a loop therein whereby the loop formed in said flexible cable is placed over the open-link retaining element at the end of said first side chain and then said flexible cable is passed across the tread of



said tire and thence passing through the closed-link retaining element at the end of the second of said side chains, and the portion of said flexible cable between said second closed-link retaining element and said snap hook is passed over the open-link retaining element at the end of said second side chain, said cable is then pulled tight to position the tire chain in contact with the tire, and the free end thereof is secured by fastening said snap hook to a link of said second side chain.

3,884,284

DEVICE FOR PREVENTING THE SKIDDING OF WHEELS AND SIMILAR OBJECTS

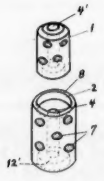
Martti Salakari, 21500 Piikkio, Finland

Filed Mar. 16, 1973, Ser. No. 342,251

Claims priority, application Finland, Mar. 22, 1972, 780/72

Int. Cl. B60c *11/16*

U.S. Cl. 152—210 **6 Claims**



1. A stud for installation in the wearing surface of a tire made of resilient material comprising:

a stem formed with a control bore;

a concentric sleeve fitting at least partly over said stem; and a central shank having a wear-resistant head-part projecting from said central bore, and adapted to engage a roadway, said stem and said shank being formed with a plurality of holes extending from respective outer surfaces thereof substantially in a direction towards the central axis of said stem for receiving at least portions of said resilient material.

3,884,285

ABRASION-RESISTANT RUBBER COMPOSITIONS

David B. Russell, Westfield, N.J., and Thomas J. Doran, Jr., Norton, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 187,838, Oct. 8, 1971, abandoned. This application Oct. 11, 1973, Ser. No. 405,725

Int. Cl. B60c *5/00*; **C08c** *11/10*, *11/12*

U.S. Cl. 152—330 R **23 Claims**

1. A vulcanized rubber composition comprising the vulcanizate of a vulcanizable rubber polymer, from 5 to 100 parts, per 100 parts of rubber polymer, of finely-divided reinforcing siliceous pigment, and between 0.1 and 15 parts, per 100 parts of rubber polymer of an organic coupling agent the functional groups of which consist essentially of at least one sulfur functional group capable of bonding to the rubber polymer and at least one nitrogen functional group capable of bonding to the siliceous pigment provided that when the nitrogen functional group is amino the coupling agent has at least two such groups.

3,884,286

WHEEL RIMS

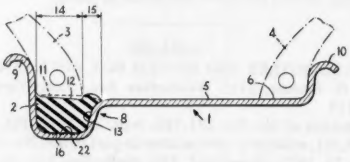
Henri Verdier, Beauregard-l'Eveque, France, assignor to Compagnie Generale des Etablissements Michelin raison sociale Michelin & Cie, France

Filed July 17, 1974, Ser. No. 489,106

Claims priority, application France, July 30, 1973, 73.27921

Int. Cl. B60c *5/00*

U.S. Cl. 152—375 **9 Claims**



1. A wheel rim having a base and two seats for tire beads, each seat being extended by a flange, and provided with a mounting well adjacent one flange and a removable annular device filling the well, characterized by the fact that:

a. the mounting well is contiguous one of the flanges and forms an extension thereof,

b. the annular filling device is a stretchable flexible lining having a radial profile such that the lining applies itself against the walls of the mounting well and forms the seat for a tire bead and an extension of this seat to the rim base, and that at least the bead seat and its extension which are formed by the lining are compressible without variation in the total volume of the lining.

3,884,287

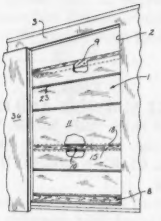
TEMPORARY LOAD RETAINING BARRICADE FOR THE DOORWAY OF A FREIGHT CARRIER

Donald L. Riviere, and Paul M. Thomsen, both of Neenah, Wis., assignors to Menasha Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 250,526, May 5, 1972, abandoned. This application Apr. 6, 1973, Ser. No. 348,663

Int. Cl. E06b *5/00*

U.S. Cl. 160—368 G **18 Claims**



1. In a temporary load retaining barricade for the doorway of a freight carrier, a pry board at the lower end of the barricade, a top board at the upper end of the barricade, at least one reinforcing member intermediate the pry board and the

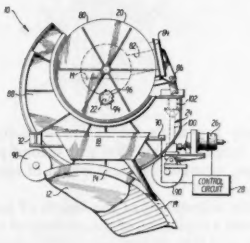
top board, and a generally planar paperboard panel extending between the pry board and the top board and having an inwardly offset portion forming a trapezoidal cavity enveloping the intermediate reinforcing member, said trapezoidal cavity formed by the inwardly offset portion of the paperboard panel includes a lower wall generally normal to the doorway for seating the reinforcing member and an opposed upper wall disposed angularly relative to the doorway.

3,884,288

METHOD AND APPARATUS FOR TUNDISH LEVEL CONTROL

Milton E. Berry, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Feb. 22, 1973, Ser. No. 334,578
Int. Cl. B22d *11/06, 11/10*
U.S. Cl. 164—4 **13 Claims**



1. A method of maintaining a predetermined level of molten metal in the tundish of a continuous casting machine by controlling the continuous pouring of molten metal therein from a rotatably mounted holding furnace, comprising:

monitoring the level of molten metal in the tundish,

generating a signal in response to said monitoring indicative of said level,

comparing said signal with a reference signal and generating a control signal through a control circuit in response thereto if said comparison indicates that said level has deviated from said predetermined level,

rotating said holding furnace in response to said control signal for a predetermined selected interval of time to vary the rate of pouring of molten metal therefrom into said tundish,

preventing the rotating of said holding furnace subsequent to said selected interval for a given interval of time independently of the casting rate, and

thereafter again rotating said holding furnace in response to said control signal if the level of molten metal in said tundish still deviates from said predetermined level,

said steps of rotating and preventing continuing successively until said level reaches said predetermined level.

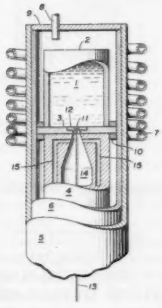
7. In a continuous wheel-band type casting machine for the continuous casting of molten metal having an arcuate mold defined by a groove formed in the periphery of the wheel which is partially closed by an endless band, a tundish disposed in juxtaposed relation to the wheel for supplying molten metal to the mold, a rotatably mounted holding furnace for supplying molten metal to the tundish, means for monitoring the level of molten metal in the tundish, and means responsive to said monitoring means for rotating said holding furnace in either direction to control the pouring of molten metal from said holding furnace into said tundish during the casting operation; the improvement comprising control circuit means operatively connected with said monitoring means and said rotating means for activating said rotating means for at least one predetermined selected interval when the level of molten metal in said tundish varies from a predetermined level, said control circuit means further including means independent of the casting rate for preventing the activating of said rotating means for a given interval after each of said at least one predetermined selected interval of activation said preventing means including timer means for resetting said control circuit means after elapse of said given interval.

3,884,289

INVISCID SPINNING OF SILICON STEEL

Lawrence F. Rakestraw, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 29, 1973, Ser. No. 392,829
Int. Cl. B22d *11/12*
U.S. Cl. 164—66 **8 Claims**



1. In a method for producing fine diameter wire from the melt of a steel-silicon alloy wherein said melt is extruded through an orifice as a continuous molten stream and into an oxygen-containing atmosphere where a solid film of silica is caused to form about the surface of the stream to preserve its continuity until solidified, the improvement which comprises:

a. heating to the melt an alloy comprised of steel and at least 0.5 percent by weight of silicon;

b. maintaining a pressurized gas mixture over the melt consisting of an inert gas and an oxygen-containing gas;

c. controlling the oxygen potential of the melt by means of said oxygen-containing gas to a level wherein the activity of silica within the melt is maintained at from 0.3 to unity;

d. causing said melt to extrude through an orifice as a continuous molten stream and into an oxygen-containing gaseous atmosphere having the capacity for increasing the oxygen potential of said stream to a level wherein silica is caused to precipitate and form a stabilizing film about the periphery of said stream;

e. cooling said film-stabilized molten stream to the solid state.

3,884,290

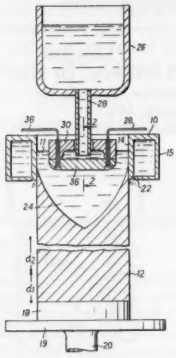
METHOD OF DIRECT CHILL CONTINUOUS CASTING

John Gordon McCubbin, Kingston, Ontario, Canada, assignor to Alcan Research and Development Limited, Montreal, Quebec, Canada

Filed Jan. 21, 1974, Ser. No. 434,784
Claims priority, application United Kingdom, Jan. 24, 1973, 3699/73
Int. Cl. B22d *11/12*
U.S. Cl. 164—82 **11 Claims**

1. A method of producing light metal ingots by the direct chill casting process in which molten metal is introduced into one end of an open-ended mould and a solidified ingot is withdrawn from the opposite end of the mould, fluid coolant being applied directly to the solidified surface of the ingot emerging from the mould, in which, in the course of forming the ingot, at one stage the ingot is withdrawn from the mould at a speed below the crack propagating speed for a sufficient

distance to develop a crack-free centre in the emerging ingot, the speed of ingot withdrawal then being increased to a speed

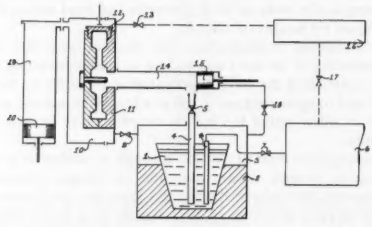


above the crack propagating speed and below the crack initiating speed.

3,884,291
APPARATUS FOR PRODUCTION OF CASTINGS FROM ALLOYS OF METALS AND GASES

Angel Tontchev Balevski, and Ivan Dimov Nikolov, both of Sofia, Bulgaria, assignors to Institut po Metaloznanie i Technologia na Metalite, Sofia, Bulgaria

Filed Oct. 2, 1969, Ser. No. 863,308
Claims priority, application Bulgaria, Oct. 10, 1968, 10793
Int. Cl. B22d *25/06, 17/10*
U.S. Cl. 164—312 **3 Claims**



1. Apparatus for the production of alloys of metals and gases, comprising a first, hermetically closed chamber, a reservoir for molten metal disposed in said first chamber, means for creating in said first chamber an atmosphere under pressure of the gas to be dissolved in the metal, a second chamber, a mould to be charged with molten metal from said reservoir disposed in the second chamber, means for injecting the molten metal into the mould, and conduit means for selectively connecting the second chamber to the first chamber and to the means for creating gas under pressure.

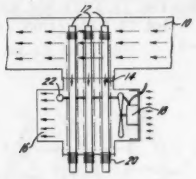
3,884,292
AIR-O-SPACE HEATER MEANS FOR RECOVERING HEAT FROM A FLUID STEAM

Richard L. Pessolano, Sparta, and Robin B. Rhodes, Parsippany, both of N.J., assignors to Isothermics, Inc., Augusta, N.J.

Filed June 22, 1973, Ser. No. 372,525
Int. Cl. F28d *15/00*
U.S. Cl. 165—39 **1 Claim**

1. A means for recovering heat from a first fluid stream, said fluid stream having a defined heat content, comprising:

a. a heat pipe having a first portion and a second portion, said first portion extending into said fluid stream;
b. a wall proximately disposed to said stream, said wall adapted to confine said stream in order to prevent heat and fluid leakage from said stream, said wall defining the division between said first and second portions of said pipe;
c. means for proving a second fluid stream, said second stream having a different temperature than said first stream, said second stream disposed in thermal contact with said second portion of said heat pipe, wherein heat transfer is effectuated from the fluid stream of higher temperature to the fluid stream of lower temperature;



d. exteriorly accessible means for mutually adjusting the relative lengths of said first and second portions of said heat pipe, wherein the total length of said heat pipe remains constant,

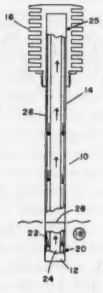
whereby the adjustment of the length of said first portion effectuates a regulation of the quantity of heat transferred between said first and second fluid streams; and

e. a blower control for said second flow stream said blower control serving to maintaining a desired rate of flow of said second flow stream with respect to said second portion of said heat pipe.

3,884,293
COOLING MEANS

Richard L. Pessolano, Sparta, and Robin B. Rhodes, Parsippany, both of N.J., assignors to Isothermics, Inc., Augusta, N.J.

Filed July 23, 1973, Ser. No. 382,024
Int. Cl. F01p *3/12*
U.S. Cl. 165—51 **5 Claims**



1. A means for cooling an oil lubrication subsystem of an automotive vehicle, comprising:

a. a heat pipe having a condensor end and an evaporator end, said evaporator end removably insertable into the dip stick hole of the oil lubrication subsystem, said heat pipe including an oil level indicator placed near said evaporator end; and
b. a heat sink joined to the condensor end, whereby heat from said subsystem is vaporously transported within said

heat pipe from the evaporator end to the condensor end, and transported therefrom into a medium of lower temperature than that of said subsystem.

3,884,294

LIQUID COOLED MIXING TOOL FOR MACHINES FOR APPLYING GLUE TO SHAVINGS

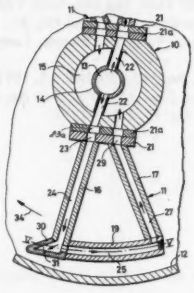
Wilhelm Lodige, Elsener Str. 9c; Fritz Lodige, Leuschner Str. 12, and Josef Lucke, Im Lohfeld 13, all of 479 Paderborn, Germany

Filed Mar. 19, 1973, Ser. No. 342,680

Claims priority, application Germany, Mar. 22, 1972, 2213778

Int. Cl. F28d *11/02*

U.S. Cl. 165—92 **14 Claims**



1. In a device for mixing materials, especially for mixing glue or the like with particles, in a horizontal drum shaped container; a horizontal shaft rotatable on the axis of the container and having first and second axial passages therein for cooling fluid, and mixing tools carried by the shaft and extending radially therefrom, each tool having a radially outer head portion adjacent the peripheral wall of the container, each head portion comprising at least two tubular legs extending in the peripheral direction and converging toward the leading side of the tool, said legs being interconnected at the leading ends and forming a pointed leading end on the tool, and means for conducting cooling fluid from one of said first and second passages in said shaft through said tubular legs and back to the other of said passages, said tool having angularly related support struts connected at the radially inner ends to said shaft and at the radially outer ends to the leading and trailing ends of said legs, said struts being tubular and converging cooling fluid between said first and second passages in said shaft and said tubular legs, said legs and struts being fixedly interconnected, said struts converging in the radially inward direction toward the shaft, a threaded substantially radial nipple member fixed to the radially inner ends of said struts, said shaft having a threaded hole for adjustably receiving said nipple member, and clamp means for clamping the nipple member to said shaft in adjusted positions in said threaded hole, said shaft having an axial bore, a pipe on the axis of the shaft smaller than said bore, said first passage being formed by the inside of said pipe and said second passage being formed by the region inside said bore and surrounding said pipe, a supply conduit connected at one end to said pipe and extending with radial clearance along the axis of said nipple member and connected at the other end to the strut which is connected to the leading ends of said legs and converging fluid between said first passage and the strut, the struts connected to the trailing ends of said legs communicating with the space in said nipple member which surrounds said conduit, said space communicating with the inside of the bore in said shaft whereby the last mentioned struts communicate with said second passage.

3,884,295

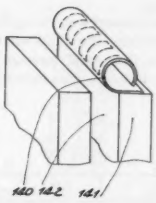
ELECTRIC STORAGE AIR HEATER

Nikolaus Laing, and Ingeborg Laing, both of Hofener Weg 35-37, 7141 Aldingen near Stuttgart, Germany

Continuation of Ser. No. 13,747, Feb. 24, 1970, abandoned. This application June 5, 1972, Ser. No. 260,012

Int. Cl. F28f *27/00*

U.S. Cl. 165—961 **2 Claims**



1. A heat storage device having an air duct therein and a closure for said duct, said closure comprising a flexible composite laminated strip member normally wound in a roll form and made up of at least two laminae of polymeric material having different coefficients of thermal expansion, said strip being secured at one end thereof adjacent said air duct, an electrical resistance heating means associated with one of said lamina whereby said one lamina may be heated to cause said one lamina to expand relative to said other lamina and to unwind said strip to mask said air duct in order to regulate passage of air therethrough.

3,884,296

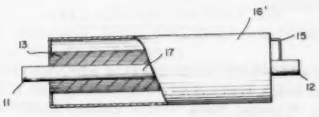
STORABLE CRYOGENIC HEAT PIPE

Algerd Basiulis, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 24, 1973, Ser. No. 400,443

Int. Cl. F28d *15/00*

U.S. Cl. 165—96 **4 Claims**



1. A cryogenic heat transfer device comprising:

an hermetically sealed, evacuated elongated housing;

a capillary wick longitudinally disposed within said housing;

an expansion reservoir in fluid communication with said elongated housing;

an insulation shell, longitudinally disposed about a substantial portion of the outer lateral surface of said elongated housing; said reservoir is a shell-like structure enclosing said insulation shell; and

a quantity of cryogenic working fluid disposed within said capillary wick and said expansion reservoir.

3,884,297

ANNULAR FLOW HEAT EXCHANGER

Clark E. Fegraus, and Jimmy G. Sundahl, both of San Bernardino, Calif., assignors to Automotive Environmental Systems, Inc., San Bernardino, Calif.

Filed Feb. 12, 1973, Ser. No. 331,514

Int. Cl. F28s *9/22*

U.S. Cl. 165—145 **6 Claims**

1. A heat exchanger having a housing and comprising:

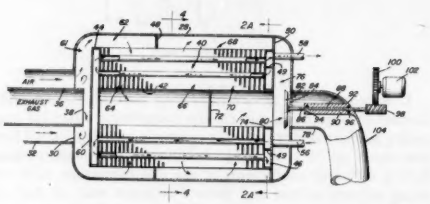
a heat exchanger fin assembly symmetrically mounted in the housing, the fin assembly including an annular cylindrical

body comprised of axially spaced fin members, the assembly being radially spaced from the housing;

inlet means having a plurality of concentric inlet tubes connected to the exchanger for delivering respective fluids to the exchanger, simultaneous entry of the fluids causing turbulent mixing of the fluids to occur;

a first axial passageway formed between the fin assembly and the housing to alternately direct the flow of mixed fluids radially and axially between the inlet means and an outlet means;

a second axial passageway being formed along the axis of the fin assembly; the fluid mixture alternately flowing between the first axial passageway, the annular space between the individual fin members, and the second axial passageway;



coolant means connected to the fin assembly for effecting desired heat transfer between the fin assembly and the fluid mixture, resulting in temperature conditioning of the fluid mixture which is homogeneous when delivered to the outlet means;

at least one annular baffle to block the first axial passageway at a preselected point therealong; and

at least one baffle disposed at a preselected point along the second axial passageway;

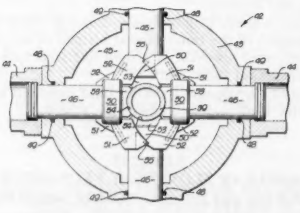
the presence of the annular and axial baffles forcing the fluid flow to make several passes through the fin assembly between the inlet and outlet means thereby increasing the temperature conditioning of the fluids and the homogeneity thereof.

3,884,298

APPARATUS AND METHOD FOR PREVENTING WEAR ON SUBSEA WELLHEAD ASSEMBLY OR THE LIKE

Bruce J. Watkins, Palos Verdes Estates, Calif., assignor to Regan Offshore International, Inc., San Pedro, Calif.

Filed June 21, 1973, Ser. No. 372,169
Int. Cl. E21b 7/12
U.S. Cl. 166—.5 **7 Claims**



1. In apparatus for carrying out subsea operations wherein a wellhead assembly is in fluid communication with a well borehole extending down into a subterranean formation, said assembly having a string of pipe extending therethrough from the water surface generally coaxially aligned with said wellhead assembly and down into said well borehole, said apparatus comprising:

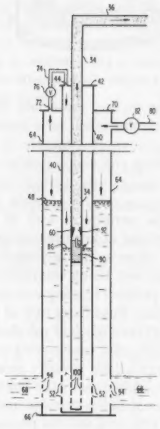
B.O.P. stack means operatively engaging said wellhead assembly and having said string of pipe passing generally coaxially therethrough, said stack means having wear preventing means associated therewith for preventing wear by said string of pipe passing therethrough, said wear preventing means including a plurality of spaced rams selectively movable from a first position in contact with said string of pipe to a second position in a direction generally transverse to the longitudinal axis of said string of pipe, each of said rams having a replaceable wear pad at the forward ends of each of said rams adapted to contact and bear against said string of pipe when said rams are in said first position, said rams being spaced from one another a distance sufficient to pass oil well tools therethrough.

3,884,299

WELL PUMP FOR FLUIDS AND VAPORS

Arol B. McCarter, and Seymour Van Os, Jr., both of Longview, Tex., assignors to R. E. Blount, Longview, Tex., a part interest

Continuation of Ser. No. 313,620, Dec. 11, 1972, abandoned.
This application June 24, 1974, Ser. No. 482,655
Int. Cl. E21b 43/00
U.S. Cl. 166—68 **7 Claims**

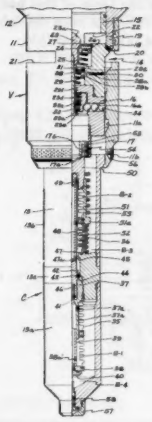


1. An improved well pump for fluids and vapors comprising a set of at least two concentrically disposed pipes for stringing down into a well below fluid level, said set consisting of an inner pipe and an adjacent annulus each having an upper and a lower terminal thereof, an external supply of gas coupled to the upper terminal of the adjacent annulus for feeding gas under pressure down therein, aerator means disposed at the lower terminal of the inner pipe for coupling the gas of the adjacent annulus into the inner pipe including emulsifying means for causing the gas to comingle with the well fluids, and venturi means within the flow path downstream of said aerator means and said emulsifying means for causing a slight suction in an upward direction in the inner pipe of the well fluids, so that the foamed and emulsified well fluids are forced upward and discharged at the upper terminal of the inner pipe at the earth's surface with very low applied pressure.

3,884,300
AUTOMATIC SAFETY VALVE

Henry U. Garrett, Longview, Tex., assignor to Macco Oil Tool Co., Inc., Houston, Tex.

Division of Ser. No. 153,617, June 16, 1971, Pat. No. 3,802,504. This application Nov. 28, 1973, Ser. No. 419,513
Int. Cl. E21b *43/12*
U.S. Cl. 166—133 **13 Claims**



9. An automatic safety valve for use in a well conduit comprising:

a. valve body means having a flow passage means extending through at least a portion of said valve body means, said passage means including inlet and outlet means;

b. movable valve closure means connected with said valve body means for opening or closing said passage means to respectively permit or terminate the flow of fluids through said passage means;

c. pressure responsive means connected by a linking means with said closure means, said pressure responsive means being movable from a first position to a second position for automatically moving said closure means from open position into closed position in response to pressure conditions present within said well conduit;

d. valve seat means included in said closure means;

e. valve stem means included in said closure means, said stem means including sealing means for sealingly engaging and disengaging said seat means to respectively terminate or permit flow through said passage means; and

f. means included in said linking means for permitting said pressure responsive means to return from said second to said first position without unseating said sealing and seat means.

3,884,301
METHOD OF GRAVEL-PACKING A HIGH-PRESSURE WELL

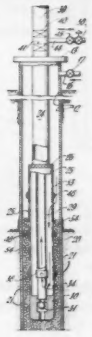
Eric B. Turner, Pointe-a-Pierre, Trinidad And Tobago, and John A. Schell, Morgan City, La., assignors to Texaco Trinidad, Inc., Pointe-a-Pierre, Trinidad And Tobago

Filed Nov. 23, 1973, Ser. No. 418,791
Int. Cl. E21b *43/04*
U.S. Cl. 166—278 **7 Claims**

1. Method of gravel-packing a well that penetrates a high-pressure formation, wherein said well contains weighted drilling mud to control said high pressure, and wherein said well has a tubing string suspended within a casing, which comprises:

positioning a screen and washpipe with valve means for permitting only downward flow from said tubing through said washpipe and for controlling reverse flow upward into said tubing only near the lower end of said washpipe inside said screen adjacent to said formation,

displacing said mud from said well adjacent to said formation while holding enough pressure to contain said high-pressure formation by circulating a wash fluid down said tubing string, and



placing gravel to pack said well opposite said formation by reversing said wash fluid circulation to flow said gravel down the well annulus while continuing to hold said containment pressure,

whereby an uncontaminated gravel pack of a high-pressure formation is obtained.

3,884,302
WELL CEMENTING PROCESS

Joseph U. Messenger, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 29, 1974, Ser. No. 474,290
Int. Cl. E21b *33/16*
U.S. Cl. 166—291 **6 Claims**

5. In a method of cementing casing in a well penetrating a subterranean formation wherein a cement slurry is flowed into the annulus formed intermediate the casing and the wall of the well and is allowed to set and bond the casing to the wall of the well, said well having a drilling mud therein, the improvement comprising:

a. flowing in turbulent flow into said annulus an aqueous alkaline wash having a pH of at least 10;

b. flowing in plug flow into said annulus and in contact with said aqueous alkaline wash an aqueous preflush that has a characteristic of forming a viscous film upon contact with a fluid having a pH of at least 10; and

c. flowing in plug flow into said annulus and in contact with said aqueous preflush and cement slurry.

3,884,303
VERTICALLY EXPANDED STRUCTURE-BIASED HORIZONTAL FRACTURING

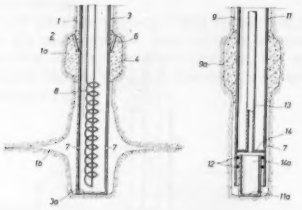
Philip J. Closmann, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 27, 1974, Ser. No. 455,170
Int. Cl. E21b *43/26*
U.S. Cl. 166—308 **3 Claims**

1. A process for horizontally fracturing a subterranean earth formation, which process comprises:

connecting a vertically expandable structure to said formation at locations above and below a selected depth within the earth formation;

applying a vertical expanding force to the structure so that the applied force causes a vertical expansion substantially free of horizontal expansion and reduces the vertical



compressive stress within the earth formation until it becomes the least of the mutually perpendicular compressive stresses within the earth formation at the selected depth; and

concurrently, pressurizing fluid in contact with the so-treated earth formation to induce a fracture at or near the selected depth.

3,884,304

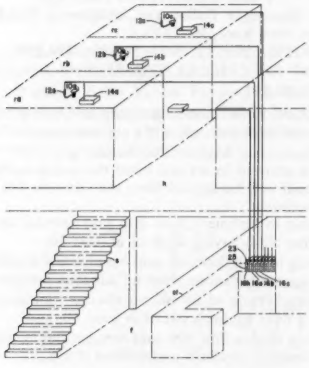
FIRE SAFETY SYSTEMS

Robert P. Messerschmidt, 9390 Union Cemetary Rd., Loveland, Ohio 45140, and Lloyd D. Montag, 39 Millie Ave., Milford, Ohio 45150

Filed July 24, 1972, Ser. No. 274,817

Int. Cl. G08b *13/22*

U.S. Cl. 169—16 **29 Claims**



1. A fire safety system comprising:

a water sprinkler head connected to a source of pressurized water, and including a valve and means, restrained by a fusible element, for holding said valve in a closed position preventing discharge of water from said sprinkler,

a smoke detector including means for producing an output signal in response to a given rise in smoke density,

means responsive to said output signal for generating heat sufficient to melt said fusible element, thereby releasing said valve and discharging water from said sprinkler.

3,884,305

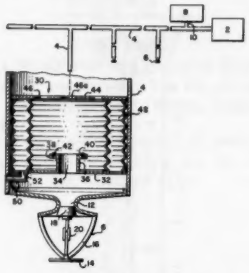
FIRE EXTINGUISHING SYSTEM HAVING A VARIABLE EXTINGUISHANT DISCHARGE RATE

William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.

Division of Ser. No. 288,373, Sept. 12, 1972, which is a division of Ser. No. 61,801, Aug. 6, 1970, Pat. No. 3,714,964, which is a division of Ser. No. 770,248, Oct. 24, 1968, Pat. No. 3,592,270. This application Oct. 12, 1973, Ser. No. 405,894The portion of the term of this patent subsequent to July 13, 1988, has been disclaimed.

Int. Cl. A62c *37/06*

U.S. Cl. 169—37 **7 Claims**



1. A fire extinguishing system comprising a source of fluid, at least one discharge head mounted in proximity to an area to be protected from fire, conduit means connecting said source of fluid to said head, means responsive to a predetermined fire condition in said area for permitting fluid flow from said source, through said conduit means, and to said head for discharge from said head, and fluid flow control means disposed in said conduit means for regulating the rate of fluid discharge from said head, said control means being automatically responsive to fluid pressure conditions in said system for permitting fluid flow at a predetermined relatively high rate and thereafter at a predetermined relatively low rate.

3,884,306

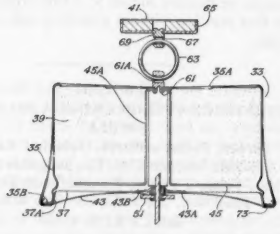
FIRE EXTINGUISHER

Robert A. Williams, 55 Bounty Rd. East, Forth Worth, Tex. 76116

Filed Nov. 12, 1973, Ser. No. 414,627

Int. Cl. A62c *35/02*

U.S. Cl. 169—59 **12 Claims**



1. A fire extinguisher comprising:

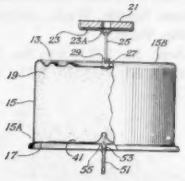
a closed container,

a fire extinguisher substance located in said container,

spring means biased normally to apply force to at least one selected wall portion of said container to form an opening in said container when its force is released,

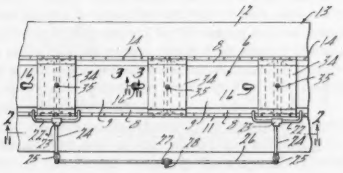
a meltable holding member for normally holding said spring means in its normally biased position and for releasing said spring means when said holding member melts, and a heat sensitive fuse or firetrain adapted to ignite in the presence of temperature of a given intensity to apply heat to said holding member to allow said member to melt and release said spring means to form an opening in said container to allow said fire extinguishing substance to pass out of said container through said opening.

3,884,307
FIRE EXTINGUISHER
Robert A. Williams, 55 Bounty Rd., East, Fort Worth, Tex. 76116
Filed Nov. 12, 1973, Ser. No. 414,660
Int. Cl. A62c *13/26*
U.S. Cl. 169—59 **26 Claims**



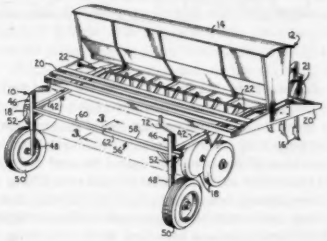
1. A fire extinguisher comprising:
a closed container,
a fire extinguishing substance located in said container,
force producing means located in close proximity to a given portion of the wall of said container for use primarily for opening only said given portion of said container wall when actuated, and
heat sensitive means for actuating said force producing means in the presence of heat above an undesired level to form said opening to allow said fire extinguishing substance to pass out of said container,
said heat sensitive means comprising:
a metallic wire having a high thermal conductivity,
a fast burning substance located around said wire,
cover means wrapped around said substance to provide strength for said heat sensitive means and to hold said substance in place, and
a water-proof layer of highly flammable material deposited on said cover means.

3,884,308
FIRE EXTINGUISHER MECHANISM FOR A TRAILER
William M. Green, 11278 Ford Rd., Brighton, Mich. 48116
Filed Mar. 11, 1974, Ser. No. 449,610
Int. Cl. A62c *35/12*
U.S. Cl. 169—62 **6 Claims**



1. In a fire extinguishing system for a trailer, tank means for holding water, overhead supporting means for said tank means, said tank means being mounted in adjacent relation with the adjacent walls sloping downwardly to form a V-shaped recess, fill means for introducing water into said tank means, and vent means on said tank means for permitting the flow of air therethrough as water flows into and out of the tank means until filled therewith when the water closes the vent means.

3,884,309
BIDIRECTIONAL DRILL TRANSPORT
Emanuel Schneider, 104 Eighth St., Wakeeney, Kans. 67672
Filed Nov. 23, 1973, Ser. No. 418,450
Int. Cl. A01b *63/16, 73/00*
U.S. Cl. 172—240 **4 Claims**

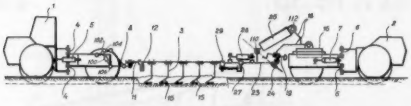


1. A bidirectional transport for agricultural equipment comprising:
a carrier frame adapted to be connected to said equipment;
a wheel adapted to run in engagement with the ground;
an upright wheel support mounting said wheel for rotation about a fixed axis; and
selectively operable structure on said frame securing said wheel support thereto in either of a pair of fixed positions corresponding to two different directions of movement of the equipment extending front to rear and transversely of the equipment respectively, said axis of the wheel when said support is in one of said positions being at an angle of approximately 90° relative to the location of the axis when said support is in the other of said positions,
said structure and said support presenting upper and lower, mating coaxial members having an upright common axis, said members being of polygonal configuration transversely of said common axis to present interengaging corner shoulders preventing relative rotation thereof about said common axis,
said structure including jacking means coupled with said lower member presented by the wheel support for raising and lowering said carrier frame relative to said wheel and for extending said lower member to a disposition clearing said upper member to permit remating thereof in either of said positions.

3,884,310
WORKING AGGREGATE, MORE PARTICULARLY FOR SOIL CULTIVATION
Josef Soucek; Zdenek Brazda, and Alexandr Grecenko, all of Prague, Czechoslovakia, assignors to Vyzkumny ustav zemedelskych stroju, Prague, Czechoslovakia
Filed June 12, 1973, Ser. No. 369,220
Claims priority, application Czechoslovakia, June 30, 1972, 4688-72
Int. Cl. A01b *51/00*
U.S. Cl. 172—292 **9 Claims**

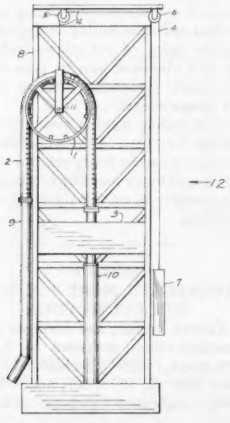
1. A working aggregate for soil cultivation comprising in combination:
a working unit for supporting tools vertically, and horizontally pivoted between two power units comprising:

a. a front power unit,
b. a rear power unit,
c. said working unit supporting working tools,
d. means for swingably mounting said working unit at one end thereof on the front power unit and means for swingably mounting said working unit at the other end thereof on the rear power unit so that the said working unit is suspended between the front and rear power units,
e. first lifting means attached to the working unit and to the front power unit and second lifting means attached to the working unit and the rear power unit for lifting



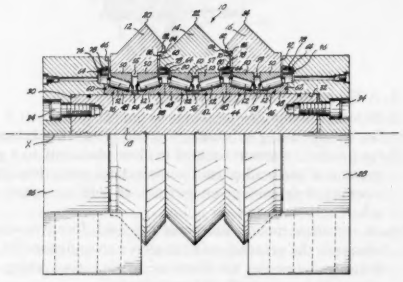
the working unit in relation to the front and rear power units into transport position and to lower the working unit into operative position, said second working means comprising a turntable mounted on the rear power unit, a rear lifting arm journalled to said turntable, a rear transverse rod mounted in said rear lifting arm and an implement holder attached to the said rear transverse rod and rotatably connected to the working unit,
f. deflecting means attached to the working unit and to the rear power unit for positively deflecting the working unit in relation to the front and rear power units into axial alignment for transport purposes and out of alignment for operation.

3,884,311
VERTICAL CONNECTING HOSE SUPPORT
Kenneth Harmon Eddy, Beaumont, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Mar. 27, 1974, Ser. No. 455,103
Int. Cl.[2] E21B *17/00, 41/00*
U.S. Cl. 173—57 **2 Claims**



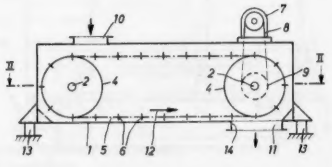
1. An earth boring machine that operates to circulate drilling fluid through an earth borehole thereby picking up materials such as borehole fluids and debris from the borehole and transfers the drilling fluid and materials through a rotating drill pipe, comprising:
a fixed support frame;
a traveling frame mounted for travel along said fixed support frame;
means connecting said traveling frame and said rotating drill pipe;
a flexible rotary hose with one end connected to said rotating drill pipe;
means for moving said drilling fluid and materials through said rotary hose;
a rotatable wheel supporting said flexible rotary hose;
a weight;
a cable connected between said rotatable wheel and said weight; and
a sheave connected to said fixed support frame for supporting said cable.

3,884,312
ROCK CUTTER ASSEMBLIES
William C. Williams, Seattle, Wash., assignor to The Robbins Company, Seattle, Wash.
Filed Sept. 12, 1973, Ser. No. 396,542
Int. Cl. F16c *35/00;* **E21b** *9/08*
U.S. Cl. 175—372 **13 Claims**



1. A rock cutter assembly comprising, first and second rock cutter wheels mounted axially adjacent each other for independent free rotation about a common axis, a hard material seal ring between said cutter wheels, means mounting said seal ring onto said first cutter wheel for rotation therewith and in sliding sealing contact with said second cutter wheel.

3,884,313
CONTINUOUSLY OPERATING MEASURING DEVICE FOR POURABLE MATERIALS
Kaspar Engels, Mannheim, Germany, assignor to Draiswerke GmbH, Mannheim, Germany
Filed Mar. 11, 1974, Ser. No. 450,176
Claims priority, application Germany, Mar. 10, 1973, 2312129
Int. Cl. G01g *13/02*
U.S. Cl. 177—119 **10 Claims**



1. In a continuously operating measuring device for pourable materials, comprising: a closed housing having a material inlet and a material outlet; a circulating, driven feed device

located within said housing for transporting material through said housing, from said material inlet opening to said material outlet opening; and a weighing device which supports the housing, the improvement wherein:

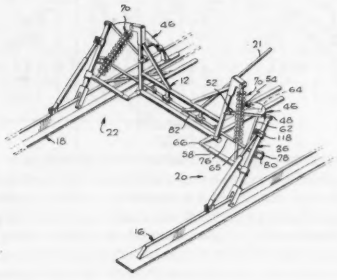
said driven feed device comprises a plurality of chain wheels, endless chains supported by said chain wheels, and entrainment means to push the material across the bottom of the housing, said entrainment means being supported by said chains and driven thereby and said entrainment means extend from said chains and slidably engage said bottom of said housing.

3,884,314

SNOWMOBILE SKI SUSPENSION SYSTEM

Mel Callaway, Riverside, Calif., assignor to Yamaha International Corporation, Buena Park, Calif.

Filed Apr. 12, 1974, Ser. No. 460,352
Int. Cl. B62m *27/02*
U.S. Cl. 180—9.54 **3 Claims**



1. A snowmobile comprising:

a chassis having front and rear ends;

a track drive coupled to the rear end of the chassis for propelling it along the ground;

a pair of laterally spaced skis positioned at the front end of the chassis for supporting and steering the chassis, each ski including a strip-shaped runner in contact with the ground and an upwardly extending beam extending along the length of the runner;

a pair of spindles, each having a lower end pivotally mounted about a transverse axis on the upwardly extending beam of one of said skis and extending with a rearward and upward incline therefrom to an upper spindle end;

a pair of lower suspension members, each having an inner end pivotally mounted on the chassis and an outer end universally connected to a middle portion of a spindle between the ends thereof;

a pair of upper suspension members, each having an inner end pivotally mounted on the chassis and an outer end universally connected to the upper end of a spindle;

two pairs of drag means, each drag means connecting one of said suspension members to a chassis location which is positioned behind the inner end of the corresponding suspension member;

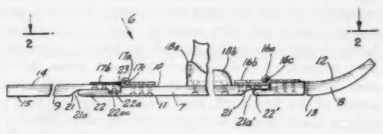
a pair of shock absorbers, each extending between the chassis and one of the suspension members to transfer part of the chassis weight to the suspension member; and a pair of dampeners, each extending from a position on a corresponding spindle which is above the lower spindle end, to a location on an upwardly-extending beam of a corresponding ski which is forward of the lower spindle end.

3,884,315

SAFETY SKI

Leonard J. Fox, 43 Stratton Rd., Scarsdale, N.Y. 10583

Filed Apr. 26, 1973, Ser. No. 354,894
Int. Cl. A63c *5/02*
U.S. Cl. 280—11.13 K **6 Claims**



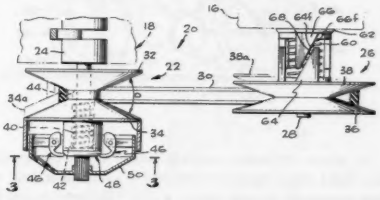
1. A safety ski device comprising in combination: a substantially flat-bottomed ski strip elongated along its forward-to-rearward axis and divided into a least a main portion and a rearward trailing portion, the main portion including boot-mount means for mounting on a top face of the ski strip a boot element by which a skier may foot-mount the ski strip, hinge means pivotably mounting the rearward trailing portion, and biasing leaf-spring means including (a) mounting-structure projections projecting a predetermined distance from upper faces of each of the main portion and the rearward trailing portion to points located spaced-above said upper faces and (b) at least one leaf spring fixedly mounted at one end of its elongated axis and slidably mounted at an opposite end of its elongated axis onto and extending between said projections of the main portion and of the rearward trailing portions respectively, said main portion and said rearwardly trailing portion being axially aligned with one-another, the rearward trailing portion being pivotable upwardly from the hinge means, the leaf-spring means exerting a predetermined degree of biasing pressure and being mounted such that biasing stress is applied to each of the main portion and the rearward trailing portion respectively, biasing the rearward trailing portion into a normally about axially aligned position, said pivotable and biased rearwardly trailing portion being responsively pivotable to predetermined degrees in number dependent upon the amount of excessive upwardly directed pressure applied to a bottom face of the rearwardly trailing portion.

3,884,316

MOTORCYCLE TRANSMISSION

Michael R. Bowers, Westminster, Calif., assignor to Yamaha International Corporation, Buena Park, Calif.

Filed Mar. 29, 1973, Ser. No. 345,905
Int. Cl. B62d *61/02*; **F16n** *55/52*
U.S. Cl. 180—33 B **1 Claim**



1. A motorcycle comprising:

a motorcycle frame;

front and rear wheels rotatably mounted on the frame;

an engine mounted on the frame;

first and second shafts respectively coupled to the engine and rear wheel;

a first pulley means including first and second pulley sheaves rotatably fixed to said first shaft, said first pulley sheave axially slideable on the first shaft, said pulley sheaves having cone-shaped faces;

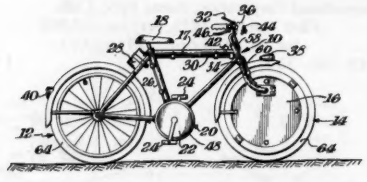
a second pulley means mounted on said second shaft;
a belt extending around said first and second pulley means to transmit power therebetween;
a cam member fixed to the moveable pulley sheave on said first shaft;
a second assembly including a support fixed to said first shaft and a plurality of centrifugal weights pivotally mounted on the support and having first end portions engaged with said cam member, said centrifugal weights being urged to pivot by centrifugal forces, when the support rotates, so that said end portions press against the cam member with a force that increases with rotational speed of the first shaft, said force urging said first pulley sheave towards said second pulley sheave; and
a spring preloaded to urge said second pulley sheave away from said first pulley sheave;
said cam member formed with predetermined engagement and top speed cam regions that sequentially engage the centrifugal weights as the moveable pulley sheave moves sequentially from an engagement position wherein the force of the centrifugal weights thereon first exceeds the preload of said spring so that the cam member and moveable pulley sheave begin to axially slide, and a top speed position wherein said pulley sheaves are closest together; the face angle of said cam member, as measured between the radial direction to the axis of the first shaft and imaginary lines normal to the cam face, increasing from less than 45° at said engagement position to an angle of 45° at an intermediate position, and a predetermined high angle of more than 45° at said top speed position, the axial distance K_2 between said intermediate position and said top speed position being less than one-half the axial distance K_1 between said engagement position and said top speed position;
said cam member being formed so the face angle changes from 30° to 60° along an axial distance K_3 which is less than one-third said axial distance K_1.

3,884,317

ELECTRICALLY POWERED CYCLE

Augustus B. Kinzel, 1738 Castellana Rd., La Jolla, Calif. 92037

Filed Mar. 5, 1974, Ser. No. 445,826
Int. Cl. B60l *11/12*
U.S. Cl. 180—34 **10 Claims**



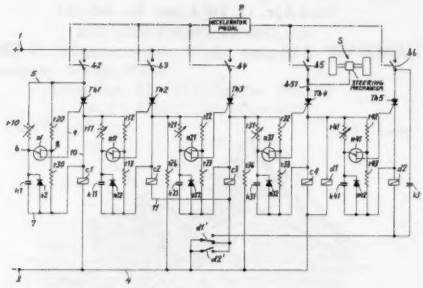
1. A power operated multiple wheel cycle comprising, a frame, front wheel means connected to said frame, rear wheel means connected to said frame, a user's station on said frame between said front wheel means and said rear wheel means for accommodating the user, pedal means at said user's station for being rotated by the force imparted by the user, a generator mounted to said frame driven by said pedal means, said generator having its generator field provided by permanent magnets, motor means associated with one of said wheel means for causing its wheel means to rotate for imparting motion to the cycle, and transmission means between said generator and said motor means whereby said generator drives said motor means to cause the cycle to move in accordance with energy imparted by the user to said pedal means.

3,884,318

ELECTRIC-POWERED VEHICLE WITH TIME-DELAY SWITCH CIRCUITRY, ESPECIALLY FOR ELECTRICAL VEHICLES

Theodor Abels, Breunsberg, and Siegfried Puschel, Aschaffenburg, both of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Apr. 3, 1972, Ser. No. 240,475
Claims priority, application Germany, Apr. 8, 1971, 2117357
Int. Cl. B60l *15/12*
U.S. Cl. 180—65 R **8 Claims**



1. A vehicle comprising driven wheels, a direct-current source, an electric motor connected to said source and operating said wheels, a plurality of sequentially operable current-control devices for said motor energizable to establish respective states of operation of said motor, and a time-delay switching circuit interposed between said direct-current source and said motor, said circuit including a plurality of stages for the sequential control of said current-control devices each stage comprising:
a thyristor having its main electrodes connected in circuit with a respective one of said current-control devices across said source;
an R-C network having a series-connected resistor and capacitor connectable to said source for charging of said capacitor through said resistor from said source, each R-C network except that of the first stage being connected between the output side of the thyristor of its stage and the output side of the thyristor of the next stage;
a voltage-divider network connected to said source, each voltage-divider network except for that of the first stage being connected between the output side of the thyristor of its stage and the output side of the thyristor of the next stage; and
a unijunction transistor having its emitter connected to said R-C network between the resistor and capacitor thereof, a first base connected to said voltage-divider network for establishing the threshold voltage of said unijunction transistor, and a second base connected to the gate of said thyristor said networks of said first stage each having one terminal connected to the output side of the thyristor of the respective stage and another terminal connected to the input side of the latter thyristor, said voltage-divider networks each consisting of two resistors between which the said first base of the respective unijunction transistor is connected.

3,884,319
HYDRAULIC SERVO-STEERING SYSTEM

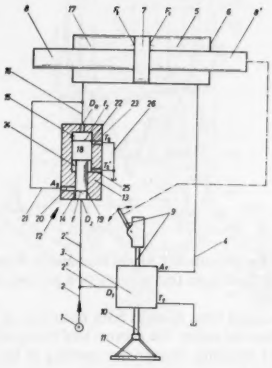
Gunter Strauff, Hanauerwag, Germany, assignor to Langen & Co., Dusseldorf, Germany

Filed Dec. 18, 1972, Ser. No. 316,398

Claims priority, application Germany, Dec. 16, 1971, 2162385

Int. Cl. B62d *5/08*

U.S. Cl. 180—79.2 R **11 Claims**



1. A hydraulic servo-assisted steering system for vehicles having steerable road wheels and a steering wheel comprising: a pressure source; a reservoir; a transmission including at least two parts interposed between the steering wheel and the steerable road wheels; a servo-motor which assists steering and acts on any convenient point of that part of the transmission which is remote from the steering wheel,; and a control valve which responds to small relative movements between said two parts of the transmission; the control valve according to the hand of said relative movement connecting a working space of the servo-motor either with the pressure source or with the reservoir; the improvement including a pressure changing means located in a connection between the pressure source and that working space of the servo-motor which is not controlled by the control valve.

3,884,320
SELF-DRIVEN MACHINE, WITH DIFFERENTIAL STEERING

Raymond Louis Auguste Leveau, 175 Boulevard Murat, 75016 Paris, France

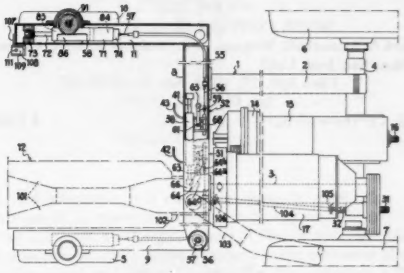
Filed July 30, 1973, Ser. No. 383,608

Claims priority, application France, July 31, 1972, 72.27519

Int. Cl. B62d *49/00*

U.S. Cl. 180—79.2 C **18 Claims**

1. A self-driven machine, in particular for agricultural use, comprising: a chassis, a rear set of wheels, a differential for the rear set of wheels, an engine unit in the vicinity of of the rear set of wheels and differential, a pair of front steering wheels, a chassis element secured to the chassis and defining at the front end of the machine a yoke having a cross-member extending substantially throughout the width of the machine and two branches extending forwardly from and pivotably mounted on the cross-member, the branches respectively supporting the two steering wheels, means for angularly setting the branches relative to the cross-member, and a steering mechanism operatively connected to the steering wheels for orienting the steering wheels in the desired direction and mainly disposed within the cross-member and the branches whereby the yoke defines a space completely free in the front of the machine for receiving working equipment, said steering mechanism comprising a steering control means, a drive element responsive to the control means, an orienting device combined with each of the two steering wheels for changing the orientation of the corresponding wheel relative to a longitudinal axis of the machine transmission means, and a differential system, the drive element being operatively connected to each of the two orienting devices through the transmission means and to at least one of the orienting devices through the differential system, the differential system being operative to render the orientations imparted to the two steering wheels by the drive element through the transmission means and orienting devices different in that, in respect of orientations of the steering wheels other than those in which they are parallel to the longitudinal axis of the machine when the control means for steering the machine is in a neutral position, each wheel is oriented in a direction which is, in plan, tangent to an arc of a circle whose centre coincides with the centre of the turning circle of the machine said differential system including means for modifying the effect of the differential system in accordance with different locations of the wheels resulting from different angular settings of the branches of the yoke.



3,884,321
LOAD HANDLING VEHICLES HAVING ADJUSTABLE CAB

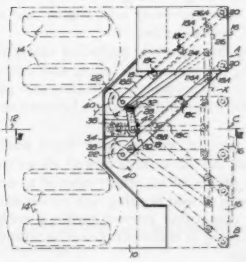
Ronald Drake, and Kenneth Smith, both of Wakefield, England, assignors to Joshua Shaw & Sons Limited, Batley, Yorkshire, England

Filed Jan. 25, 1974, Ser. No. 436,496

Claims priority, application United Kingdom, Nov. 10, 1973, 52278/73

Int. Cl. B60k *35/00*

U.S. Cl. 180—89 R **5 Claims**



1. In a vehicle of the type having an adjustable cab movable on the vehicle between two extreme laterally spaced positions, the improvement comprising

1. a pair of parallel links, each link being extensible and contractible in length, each link being pivotally anchored on the vehicle and being pivotally attached to the cab to

form a parallelogram whereby the cab can be swung laterally on the parallel links,

2. drive means adapted to turn the parallel links about the pivots anchored on the vehicle,

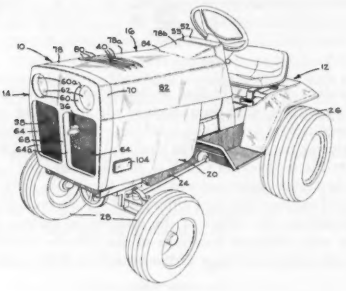
3. and restraining means connected to the parallel links and to the vehicle, the restraining means causing the length of the parallel links to be altered as the cab moves whereby lateral motion of the cab is confined to a substantially straight path.

3,884,322

NOISE CONTROLLING HOUSING

Mark S. Nemschoff, Mequon, Wis., assignor to FMC Corporation, San Jose, Calif.

Filed Apr. 27, 1973, Ser. No. 355,105
Int. Cl. G10k *11/00*
U.S. Cl. 181—33 K **4 Claims**



1. In a garden tractor or the like having an engine and a muffler together defining a noise source supported on a wheeled chassis and having grille and curved hood means on said tractor adjacent said engine, the improvement comprising:

a noise-controlling housing including front, side, and top portions fully enclosing said engine and said muffler on the front, top and sides,

said housing front portion including said grille,

said housing top portion including said curved hood,

said housing side portions constituting side panels extending rearwardly from said grille and beneath the side edges of said hood,

the major area of said housing front portion defining a compound curved surface bowed about two axes lying in different planes substantially normal to each other,

the major area of said housing side panels each defining like opposed compound curved surfaces each bowed about two axes lying in different planes substantially normal to each other,

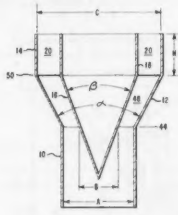
said compound curved surfaces of said housing front, side and top portions thereby together defining substantially non-resonating curved sheet metal walls whereby said housing is effective to reduce externally thereof the sound emitted from said sound source to a level substantially below that of a tractor having a comparable noise source but without said enclosing housing having said compound curved surfaces.

3,884,323

DEVICE FOR GAS-EXIT DUCTS TO CONVERT VORTICAL GAS FLOW TO SOUND-ATTENUATED AXIAL GAS FLOW

Walter George Kunz, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed July 11, 1974, Ser. No. 487,782
Int. Cl. F01n *1/00*
U.S. Cl. 181—41 **7 Claims**



1. The device for attenuating sound that results from releasing a vortical gas flow from the opening of a gas exit duct, the device comprising

i. a frustum-shaped tube open at both ends one of which is narrower than the other, the narrow end being adapted to sealably and smoothly engage the opening of the gas exit duct in axial alignment with the duct,

ii. a cone-shaped inner core having one end wider than the other, positioned withinn tube (i) to form a first annulus between the tube and the core, the wide end of the core being in the direction of the wide end of the tube,

iii. an outer body open at both ends having one end axially united to the wide end of tube (i), the outer body extending along the tube axis to provide a gas flow defining wall, the open end away from the end that is united to tube (i) having an inside diameter at least equal to the diameter of the end that is united to the tube,

iv. an inner body coaxial with and united to core (ii) having an outer diameter at least equal to the diameter of the core at the place of union, said inner body extending along the tube axis to provide a gas flow defining a second annulus in communication with the first annulus, said inner body and core (ii) combination being closed to gas flow therethrough,

v. a multiplicity of vanes axially disposed across the annulus defined by the inner and outer bodies having lengths effective to convert vortical gas flow to axial gas flow.

3,884,324

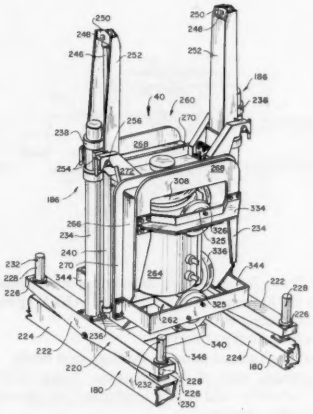
MOUNTING FOR SEISMIC VIBRATOR

Ferris F. Hamilton, Denver, and James S. Johnson, Evergreen, both of Colo., assignors to Hamilton Brothers Oil Company, Denver, Colo.

Filed Aug. 11, 1972, Ser. No. 279,880
Int. Cl. G01v *1/14*
U.S. Cl. 181—114 **9 Claims**

1. In a seismic vibrator assembly carried by a support structure, said vibrator assembly having a vibrator mass mounted for reciprocal movement in a vertical direction, the improvement comprising an inner frame having means for retaining the mass so that vibrations of the mass will be imparted directly into the inner frame, a base plate secured to the inner frame and adapted to be placed in engagement with the earth whereby vibrations of the mass will be transmitted into the earth, an outer frame anchored to the support structure and having at least a portion thereof surrounding the upper end and sides of said inner frame, and a plurality of vibration damping units interconnecting the inner and outer frames to separate said frames, said damping units including first vibration damping means separating the upper ends of said inner

and outer frames whereby to confine the application of vibrational forces generated by the mass to a downward vertical direction of movement and second vibration damping means disposed between the frames in a direction normal to said



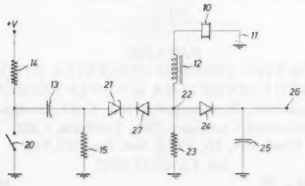
vertical direction whereby vibrations of the mass will be concentrated along said vertical direction of movement while isolating the vibrations from the outer frame so that the energy transmitted by the mass into the earth is maximized.

3,884,325

CIRCUIT FOR ENERGIZING PIEZOELECTRIC CRYSTAL AND DETECTING PEAK AMPLITUDE OF A REFLECTED SIGNAL

Christopher S. Cowles, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 14, 1974, Ser. No. 433,339
Int. Cl. G01v *1/14, 1/16*
U.S. Cl. 181—139 **4 Claims**



1. A circuit for exciting a piezoelectric transducer and detecting the peak amplitude of a reflected signal, said circuit comprising:

a resonance circuit, said transducer being coupled to said resonance circuit;

a signal source having a voltage of predetermined polarity;

a diode circuit having a breakdown voltage in one direction that exceeds the peak amplitude of the reflected signal to be detected, said voltage drop being less than the amplitude of the signal source, said diode circuit coupling said signal source to said resonant circuit; and

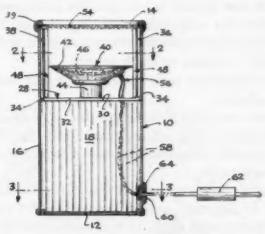
a capacitor, said capacitor being coupled to said resonant circuit by a blocking diode disposed to pass to said capacitor only signals having a polarity opposite that of said signal source.

3,884,326

LOUDSPEAKER AND ENCLOSURE ASSEMBLY

Timothy R. Orisek, 108 Stirrup Lane, Burr Ridge, Ill. 60008

Filed Mar. 6, 1974, Ser. No. 448,672
Int. Cl. G10k *13/00;* **H04r** *1/28*
U.S. Cl. 181—155 **5 Claims**



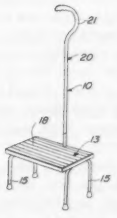
1. A loudspeaker and enclosure assembly comprising, in combination, a cylindrical container having one closed end and an open end, an elongated sheet of fibrous material coiled into a loosely wound cylinder disposed in the container abutting the closed end and partially filling the container, a flat elongated strip having two normal bends forming a central portion disposed in abutment with the wound sheet of fibrous material and a pair of legs of equal length extending from the central portion of the strip toward the open end of the container in abutment with the side of the container, a loudspeaker having a frame and vibratile cone, the frame being mounted on the strip and the cone being disposed coaxially of the container and diverging toward the open end of the container, and a cylinder of fibrous material disposed within the container and extending from the central portion of the strip to the open end of the container, said cylinder of fibrous material being disposed between the container and the frame of the loudspeaker and abutting said frame.

3,884,327

INVALID'S PORTABLE STEP UNIT AND ATTACHED CARRYING HANDLE MEMBER THEREFOR

Cary Wayne Zigman, 1239 Conell, Highland Park, Ill. 60035

Filed May 9, 1974, Ser. No. 468,402
Int. Cl. A47c *9/12*
U.S. Cl. 182—113 **1 Claim**



1. An invalid's portable step unit and carrying handle member therefor, comprising

a. a step unit including

1. a supporting frame;

2. a horizontally extending platform unit carried by the said supporting frame at the top thereof;

b. a carrying handle member including

1. a lower end portion attached to and extending vertically upwardly from the said platform unit; the said carrying handle member including

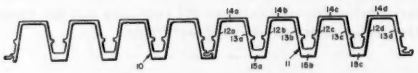
2. an upper end portion having
a. a handle attached thereto;
c. the said carrying handle member including
1. outer and inner telescopically interconnected and vertically adjustable tubular members;
d. the said handle member being attached to one of the said telescopically interconnected tubular members;
e. manually operable latching means attached to and carried by one of said telescopically interconnected tubular members for releasably latching the said telescopically interconnected tubular members in a selected position vertically relative to each other;
f. the said platform unit having front and rear surfaces and side surfaces;
g. the said carrying handle member being attached to the said platform unit adjacent the said rear surface thereof and centrally between the said side surfaces of said platform unit; and
h. the said carrying handle member including a handle which is disposed generally parallel to and in coplanar relationship with the said rear surface of the said platform unit.

3,884,328

SCAFFOLD PLANK

Chester I. Williams, 1501 Madison St., Grand Rapids, Mich. 49507

Filed Oct. 1, 1973, Ser. No. 402,614
Int. Cl. E04g *5/08, 1/16*
U.S. Cl. 182—222 **2 Claims**



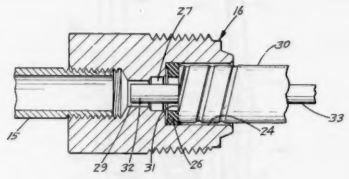
1. A stackable scaffolding plank having a cross-section adapted for extrusion, said scaffold plank having a plurality of inclined first and second web portions and a plurality of upper and lower sections interconnecting adjacent web portions at the points of closest proximity therebetween, said sections and web portions being disposed to define an undulated configuration, wherein the improvement comprises:
a first interlock portion extending along one edge of said plank and including an outer flange coplanar with said lower sections, the free edge of said outer flange having an edge offset, and an inner flange spaced from, extending parallel to, and shorter than, said outer flange;
a second interlock portion, extending along the opposite edge of said plank from said first interlock portion, adapted to mate with the first interlock portion of an adjacent scaffold plank, and including a flange having a part thereof extending parallel to and receivable between said inner and outer flanges of the first interlock portion of said adjacent similar plank, said part of said flange being spaced from the plane of said lower sections by a distance substantially equal to the thickness of said outer flange, and also having a recess normally receiving the edge offset of said similar plank; and
abutment means disposed at intermediate positions on said first and second web portions to engage said lower sections of a similar plank with said undulated configurations interengaged, said abutment means extending laterally to limit the depth of interengagement of said configurations.

3,884,329

SPEEDOMETER CABLE LUBRICATING DEVICE

Henry W. Steffen, P.O. Box 246, Morton, Minn. 56270

Filed Sept. 10, 1973, Ser. No. 395,737
Int. Cl. F16n *1/00, 21/00*
U.S. Cl. 184—1 R **8 Claims**



1. A nozzle fitting for a pressure lubricating device adapting said device to the lubrication of automotive vehicle speedometer cables, said fitting comprising:
A. a generally cylindrical body;
B. a central longitudinal passage through said body;
C. the upstream end of said passage being internally threaded, whereby said fitting is adapted for attachment to a lubricating device;
D. the opposite downstream end of said passage being a first recess of circular cross section, whereby the nozzle fitting is adapted to receive therein with a slide fit the bottom end fitting of one form of speedometer cable housing;
E. an annular shoulder at the upstream end of said first recess;
F. a sealing gasket having a central opening therein and seated on said shoulder;
G. a further recess of circular cross section disposed immediately upstream from said first named recess and in direct fluid communication therewith, the diameter of said further recess corresponding generally to the diameter of the opening in said sealing gasket;
H. an annular ring surrounding said first recess and projecting from the downstream end of said body; and
I. the end of said cylindrical body adjacent to said annular ring being externally threaded, whereby the nozzle fitting is adapted to engage the internally threaded bottom end fitting of another form of speedometer cable housing.

3,884,330

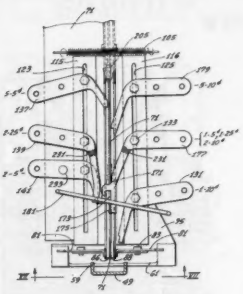
COIN OPERATED VENDING APPARATUS WITH DOOR OPERATED COIN RETURN & PAWLS THEREFORE

Jack S. Chalabian, Huntington Beach, Calif., assignor to K-Jack Engineering Company, Inc., Gardena, Calif.

Filed Nov. 10, 1972, Ser. No. 305,514
Int. Cl. G07f *5/08*
U.S. Cl. 194—59 **36 Claims**

1. A vending machine comprising
a housing having
means for supporting a product to be sold,
a door for selectively providing access to the product from the exterior of said display case, and
means for releasably locking said door comprising
a coin selecting and receiving apparatus including
a coin receiving and transfer chute,
pawl means extending into said chute at a predetermined position relative thereto,
a locking bar hingedly connected to said door and extending across the bottom of said chute and having engaging means thereon for locking said door against being opened and coin seating means thereon, and
means for opening said chute throughout the length thereof to reject the coins therein when said opening

means is actuated by said engaging means as a consumer attempts to open said door, unless the proper

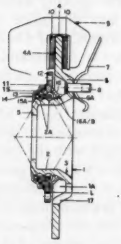


coinage is positioned between said coin seating and said pawl means.

3,884,331
BEARING UNIT

Sture L. Asberg, Partille, Sweden, assignor to SKF Industrial Trading and Development Company B.V., Overtoom, Amsterdam-W, Netherlands

Filed Nov. 1, 1973, Ser. No. 411,855
Claims priority, application Netherlands, Nov. 9, 1972, 7215139; Nov. 28, 1972, 7216088
Int. Cl. B60t *1/06*
U.S. Cl. 188—18 A **7 Claims**

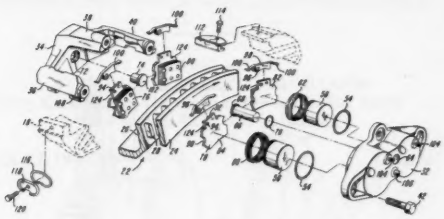


1. A bearing unit and braking device for a rotary element comprising an inner ring having as an integral one piece structure a two row bearing surface and a radially outwardly extending flange forming a braking means, said radially extending flange having an upwardly extending portion forming said braking means axially displaced from said two row bearing surface by an intermediate portion of said radially extending flange spacing said two row bearing surface from said upwardly extending portion such that the boundary plane of said braking means is axially displaced from the entire area defining said two row bearing surface, a plurality of roller elements, and an outer ring having a two row bearing surface positioned about said inner ring bearing surface with two rows of said roller elements therebetween.

3,884,332
DISC BRAKE WITH CANTILEVERED TORQUE RECEIVING MEMBERS

William D. Walther, Kettering, and Chester N. Fannin, Troy, both of Ohio, assignors to Dayton-Walther Corporation, Dayton, Ohio

Filed Mar. 14, 1974, Ser. No. 451,035
Int. Cl. F16d *65/02*
U.S. Cl. 188—73.4 **5 Claims**



1. A disc brake assembly comprising:
a. a rotatable braking disc adapted to rotate with a vehicle wheel,
b. a brake housing support including opposed brake rails disposed at spaced positions about the periphery of said disc,
c. a brake housing having rail engaging surfaces mounted on said brake rails,
d. retaining means for locking one of said rail engaging surfaces of said brake housing to one of said brake rails,
e. spring means associated with the other of said rails, engaging the other of said rail engaging surfaces of said brake housing and urging said brake housing toward said one rail and said retaining means associated therewith,
f. said brake housing including arcuately shaped piston and reaction portions disposed on opposite sides of said disc,
g. bridging means extending across a periphery of said disc from said piston to said reaction portion of said brake housing adjacent said rail engaging surfaces thereof and at the center thereof,
h. said bridging means defining a pair of openings through said housing to said disc,
i. opposed pairs of brake pads received in each of said openings on opposite sides of said disc,
j. means resiliently suspending said brake pads from said bridging means,
k. fixed pin means mounted in said reaction portion of said brake housing beneath said bridging means, extending inwardly and terminating spaced from an outer face of said disc,
l. movable pin means slidably mounted for movement axially thereof in said piston portion of said brake housing, extending axially outwardly and terminating spaced from an inner face of said disc,
m. said fixed and movable pins being disposed radially inwardly of said periphery of said disc,
n. first abutment means on each of said brake pads adapted to engage said bridging means positioned adjacent said rail engaging surfaces,
o. second abutment means on each of said brake pads adapted to engage said fixed and movable pins, and
p. piston means slidably received within said piston portion of said brake housing and adapted to effect frictional engagement of said brake pads with said inner and outer surfaces of said disc.

3,884,333

TREAD BRAKE UNIT FOR RAILWAY VEHICLES

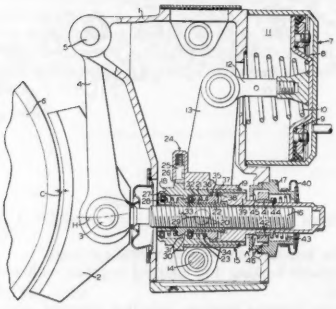
Claude Dubois, Gagny, and Georges Dalibout, Paris, both of France, assignors to WABCO Westinghouse GmbH, Freinville-Sevran, France

Filed July 15, 1974, Ser. No. 488,822

Claims priority, application France, July 16, 1973, 73.26011

Int. Cl. B60t *11/14*

U.S. Cl. 188—153 R 9 Claims



1. In a tread brake unit for braking the wheel of a railway vehicle, said unit comprising:

a. a brake shoe having a release position, in which a predetermined normal amount of clearance is provided between the wheel and the brake shoe, and being operable to an application position for applying braking force to the wheel;

b. a housing;

c. a brake hanger having one end pivotally fixed on said housing with the other end thereof movable through a first arcuate path and having said brake shoe pivotally mounted thereon at a point between the ends of the brake shoe;

d. power means supported on said housing for providing braking force for the brake shoe;

e. a brake lever having one end pivotally fixed on said housing with the opposite end pivotally connected to the power means and movable through a second arcuate path disposed radially opposite to said first arcuate path; and

f. a push rod assembly including a push rod having one end pivotally connected to said other end of said brake hanger concentrically relative to the pivotal mounting of said brake shoe and being pivotally connected, at a point of the push rod between the ends thereof, to a point of the brake lever between said one end and said opposite end thereof, said push rod having the other end thereof supported by said housing and being axially movable in a curvilinear path by said brake lever for transmitting braking force to the brake shoe; wherein the improvement comprises:

g. flexible support means disposed between said housing and the other end of said push rod for providing universal movement of said other end of the push rod relative to the housing to compensate for the curvilinear axial movement of the push rod.

3,884,334

SCREW THREAD CUTTING APPARATUS

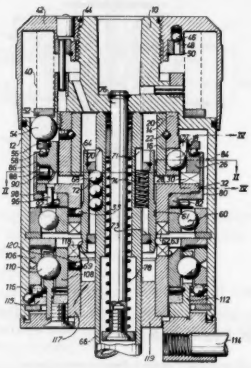
Alf A. A. Eriksson, Nacka, Sweden, assignor to Aktiebolaget Svenska Precisionsvertyg, Nacka, Sweden

Filed Oct. 17, 1973, Ser. No. 407,095

Claims priority, application Sweden, Oct. 26, 1972, 13880/72

Int. Cl. F16d *43/20*

U.S. Cl. 192—56 R 2 Claims



1. Screw thread cutting apparatus, comprising a driving part, a driven part and clutch elements provided therebetween and having drivers which when transferring torque between said parts are in engagement with one another, but on excess of a predetermined value of said torque become disengaged by axial displacement of one of said elements against the action of spring members, torque transferring locking members being provided in recesses formed firstly in said one element and secondly in one of said parts, said recesses in said one element having portions extending in a peripheral direction and presenting guide surfaces for the locking members during axial movement thereof, said one element being under the action of friction members which upon disengagement brake said one element and transfer the locking members from the torque transferring positions into the guide surfaces for complete disengagement of the drivers, and wherein for the purpose of application of this device to a reversible screw thread cutting apparatus where the driving part always has the same direction of rotation, the other clutch element comprises two concentrically arranged element parts, which within limits are rotatable relative to one another, of which element parts one is disposed for cooperation with the friction members and the other is formed with drivers so as upon reversal of the apparatus to cause the last-mentioned element part to be accelerated to higher speed by the friction members assisted by the friction moment exerted on the first-mentioned element part thereby to ensure that the drivers of the two clutch elements always return to the clutch engagement position.

3,884,335

DUAL CLUTCHES WITH SPLASH & GRAVITY COOLING CIRCUITS

Herbert Edward Ashfield, and Thomas Eastwood, both of Huddersfield, England, assignors to David Brown Tractors Limited, Huddersfield, England

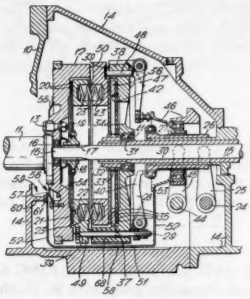
Filed Mar. 11, 1974, Ser. No. 449,682

Int. Cl. F16d *13/72*

U.S. Cl. 192—113 B 5 Claims

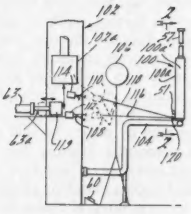
1. An engine/clutch combination comprising an engine flywheel, a shaft co-axial with the flywheel, a sleeve surrounding the shaft, a clutch mechanism including at least one clutch plate mounted on the shaft and frictionally engageable between an axially moveable pressure plate and the flywheel and

at least one clutch plate mounted on the sleeve and frictionally engageable by axial movement of another pressure plate, a stationary clutch housing enveloping the flywheel and the clutch mechanism and acting at its base as a sump, a trough within the housing forming a well accommodating the lower portions of the flywheel and the clutch mechanism and surrounded by oil in the sump, means defining a space separate from the sump between the trough and the clutch housing for collecting oil flung from the rotating flywheel and clutch



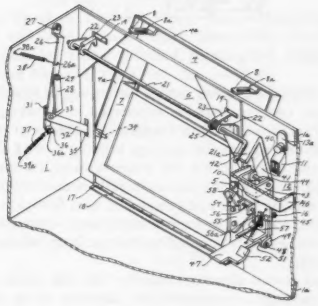
mechanism and impeding its direct return to the trough, means defining an aperture in the trough adjacent that face of the flywheel remote from the clutch mechanism, an annular groove in said face of the flywheel for receiving oil flowing through the aperture from the space, at least one passage in the flywheel for delivering oil from the groove to the clutch plate on the shaft, and at least one further passage in the flywheel for delivering oil from the groove to the clutch plate on the sleeve.

3,884,336
SAFETY MECHANISM FOR PRESSES, MACHINES AND FIXTURES
Robert W. Williamson, 77 Cedar Acres, Brunswick, Ga. 37520
Continuation-in-part of Ser. No. 351,516, April 16, 1973, Pat. No. 3,847,259. This application Jan. 23, 1974, Ser. No. 435,900
Int. Cl. F16p *3/06*
U.S. Cl. 192—131 R **53 Claims**



1. Safety mechanism for use by an operator of a machine having at least one machine elment which moves during each machine operating cycle: said safety mechanism including hand restraint apparatus comprising hand restraint means for the hands of the operator and hand restraint moving means operatively coupled with said hand restraint means for controlling the movement of said hand restraint means between a released position which permits at least one of the operator's hands to be disposed in the path of travel of said at least one machine element and a restraining position which prevents both of the operator's hands from being disposed in the path of travel of said at least one machine element; a mechanical safety interlock means controllably operable to a safety position wherein the same is disposed in the path of travel of said at least one machine element for bodily stopping travel thereof and to a retracted position wherein said mechanical safety interlock means clears the path of travel of said at least one machine element; a mechanical safety interlock moving means for moving said mechanical safety interlock means between said two operative positions thereof; and control means for interlocking said hand restraint moving means, said mechanical safety interlock moving means and the machine such that a machine operating cycle can begin only when both said hand restraint means is in its restraining position and said mechanical safety interlock means is in its retracted position.

3,884,337
COIN-OPERATED LATCH MECHANISM
Henry Carl Voegeli, 918 Gibbs Road, Venice, Fla. 33595
Filed June 5, 1974, Ser. No. 476,423
Int. Cl. G07f *11/04*
U.S. Cl. 194—59 **9 Claims**



1. A latch mechanism for use in a coin-operated dispensing device including a cabinet having a cooperative opening to provide access to said cabinet, closure means selectively to close said opening, and a coin-operated mechanism actuated upon receipt of at least one coin of selected value, comprising:

a. latch means adapted selectively to engage said closure means when said closure means is in a first selected position relative to said opening of said cabinet;

b. bias means normally to urge said latch means out of engagement with said closure means;

c. first linkage means to be disposed in a first linkage position to set said latch means in engagement with said closure means and to be disposed in a second linkage position, such that said bias means releases said latch means from engagement with said closure means;

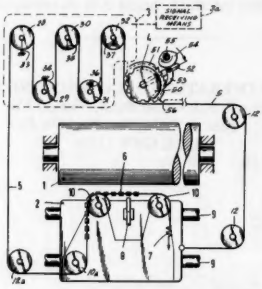
d. release means actuated by said coin-operated mechanism to actuate said first linkage means from said first linkage position to said second linkage position, when at least one coin of selected value is received by said coin-operated mechanism; and

e. reset linkage means connected to said closure means to be actuated by movement of said closure means, and adapted selectively to engage said first linkage means to move said first linkage means from said second linkage position and into said first linkage position when said closure means is moved to said first selected position relative to said cabinet.

3,884,338
DEVICE FOR ADJUSTMENT AND LINE-BY-LINE MOVEMENT OF A TYPE BODY IN A TYPE PRINTING DEVICE

Rudolf Koller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 2, 1969, Ser. No. 854,409
Claims priority, application Germany, Sept. 5, 1968, 6753614
Int. Cl. B41j *19/18*
U.S. Cl. 197—49 **7 Claims**



1. In a type printing device having a type body of a plurality of type carriers shiftably supported in a carriage to present different type carriers for striking by a hammer means carried by the carriage as the carriage is being moved along a platen member of the device, the improvements comprising;

a pull cable having one end rigidly connected to the carriage and the other end connected by a flexible connection to the carriage to form a continuous loop, said pull cable being rigidly coupled to the type body adjacent said other end;

feed means directly engaging the pull cable to move the carriage a predetermined distance along the platen in response to a feed signal; and

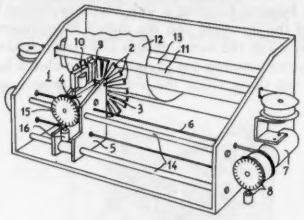
character selection means directly engaging the pull cable between the feed means and the other end to move the other end of the pull cable relatively to the flexible connection in response to a character selection signal so that the type body is shifted in the carriage to position the desired type carrier for the hammer means.

3,884,339
ASYNCHRONOUS SERIAL PRINTER

Fabrizio Castoldi, Milan; Serrio Cattaneo, Voghera, and Adriano Niccolai, Cornaredo, all of Italy, assignors to Honeywell Information Systems Italia, Milan, Italy

Continuation of Ser. No. 108,787, Jan. 22, 1971, abandoned. This application Mar. 6, 1973, Ser. No. 338,499
Int. Cl. B41j *1/32*
U.S. Cl. 197—53 **7 Claims**

1. In a serial on-the-fly printer for serially printing characters at a plurality of printing positions to form a print line, wherein a type-carrying member is maintained in continuous motion to present in sequence different characters at a printing position with the direction of motion of said characters proximate to the printing position being substantially parallel to the print line, and wherein said type-carrying member is mounted on a printing carriage which is moved between adjacent printing positions with a movement independent of the motion of said type-carrying member, the improvement comprising: detecting means for detecting the position of said type-carrying member relative to said detecting means and for delivering coded signals representing said position of the type-carrying member, comparing means for comparing said coded signals with a code representing a character required to be printed to generate signals representing the results of said comparison, and means for timing at a variable rate responsive

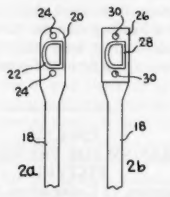


to the movement of said carriage and coupled to said comparing means, said timing means being effective for controlling printing at suitable moments in said printing positions, independently of the actual position of said printing carriage.

3,884,340
TYPE DISC AND METHOD OF MAKING SAME

Herbert Tramposch, Riverside, and David W. Hubbard, Stamford, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Oct. 10, 1973, Ser. No. 405,126
Int. Cl. B41j *1/32*
U.S. Cl. 197—53 **1 Claim**



1. A printing disc assembly constructed of a composite of structural members, said assembly comprising:

A. a disc shaped member having a plurality of flexible plastic arms radially extending outwardly from a hub portion of said disc member, said arms each having a head section at an outer portion thereof, each of said head sections having a character disposed thereon; and

B. a plurality of metal print character members annularly arranged with respect to each other and each having a character and securing means, each of said character members being respectively secured to an end portion of a corresponding arm by means of said securing means, thus forming a composite printing disc assembly, each character of said metal print members correspondingly disposed over and upon a matching character of the head sections, so as to form integral character composites.

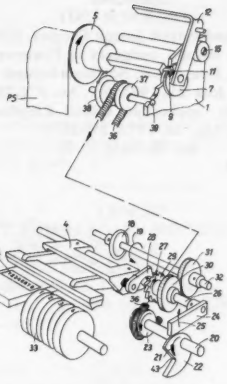
3,884,341
PAPER STRIP TRANSPORT AND PRINTING MECHANISM HAVING A COMMON DRIVE

Heinz-Gunter Wagner, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 29, 1972, Ser. No. 319,734
Claims priority, application Germany, Dec. 30, 1971, 2165941
Int. Cl. B41j *15/00*
U.S. Cl. 197—133 R **9 Claims**

1. A paper strip transport and printing mechanism comprising: a supply source for supplying paper strip; take-up means

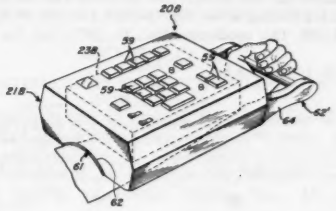
for taking up the paper strip; feeding means for feeding forwardly the paper strip taken from said supply source, said feeding means including a feed-roller engaging the paper strip, and a feed-roller gear rigidly connected to said feed-roller; printing means positioned in front of said feeding means for printing on said paper strip; and, actuating means for actuating said feeding means, said printing means and said take-up means, said actuating means including: a single drive means, first transmission means for operatively connecting said drive means to said printing means to actuate said printing means, said first transmission means including ancillary transmission means for actuating said feeding means in a predetermined time relation to the actuation of said printing means, and, second transmission means for connecting said drive means



with said take-up means to actuate said take-up means to take up the paper strip moved forward by said feeding means, said first transmission means including a first shaft keyed to said printing means, and cam-follower means operatively connecting said drive means to said first shaft for imparting thereto a reciprocative motion in response to a movement of said drive means; and, said ancillary transmission means comprising a ratchet wheel rotatively mounted on said first shaft so as to be freely rotative with respect thereto, said ratchet wheel being equipped with a gear wheel for engaging said feed-roller gear, and a pawl for coacting with said ratchet wheel, said pawl being operatively connected to said first shaft so as to be actuated by the reciprocative motion of said first shaft to turn said ratchet wheel in a direction for turning said feed-roller in a direction to feed the paper strip forward.

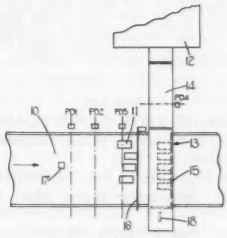
3,884,342
PORTABLE DATA SET
Robert P. Mulholland, Centerville, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Filed Oct. 22, 1970, Ser. No. 83,051
Int. Cl. B41j *29/02*
U.S. Cl. 197—186 R **2 Claims**

1. A portable data set comprising an assembly having a housing, a keyboard mounted by said housing, and a handle connected to said housing, said housing having an elongated recess in its lower surface extending toward said handle, said recess being shaped to receive the user's arm, the set being capable of being supported on the arm of the user while at the same time the handle is capable of being gripped by his one



hand and the user is able to operate the keyboard with his other hand.

3,884,343
TRANSFER APPARATUS
Derek James Stephens, Solihull; Eseni Gogo MacFarlane, Northfield, and Owen James Turner, Bournville, all of England, assignors to Cadbury Limited, Birmingham, England
Filed Mar. 12, 1973, Ser. No. 340,036
Claims priority, application United Kingdom, Mar. 10, 1972, 11297
Int. Cl. B65g *47/52*
U.S. Cl. 198—23 **15 Claims**



1. Apparatus for transferring transversely arranged rows of units from a continuously moving substantially horizontal main conveyor in a single file to a second conveyor, said second conveyor extending transversely of the main conveyor and at the same height said apparatus comprising a mobile frame movable to a position adjacent the main conveyor, a beam pivotally mounted on said frame and movable so as to extend transversely across and above the main conveyor in cantilever fashion, a stop mounted on said beam and extending transversely across the main conveyor in a position to arrest a row of units on the main conveyor, a pusher mounted on said beam and transversely movable relative to the main conveyor for transferring rows of units bearing against the stop from the main conveyor to the second conveyor, an aligning member extending parallel to, and in advance of the stop, said aligning member being arranged to arrest a row of units until individual units of a row are aligned transversely of the main conveyor and means for moving the aligning member to an inoperative position in which units can pass thereunder to the stop.

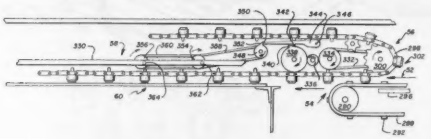
3,884,344
ARTICLE CONVEYING SYSTEM

Robert L. Hurst, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Division of Ser. No. 99,405, Dec. 18, 1970, Pat. No. 3,712,453, which is a division of Ser. No. 784,845, Dec. 18, 1968, Pat. No. 3,641,959. This application Dec. 20, 1972, Ser. No. 316,951

Int. Cl. B65g *47/26*

U.S. Cl. 198—31 AA **2 Claims**



1. Apparatus for moving articles from a predetermined location comprising: a first conveyor extending from said location to a first transfer zone and being provided with an endless loop type belt, the upper pass of which is adapted to carry articles and deliver them to the first transfer zone; a second conveyor extending from the first transfer zone to a second transfer zone and being provided with an endless loop type belt, the lower pass of which is adapted to receive articles at the first transfer zone and deliver them to the second transfer zone; and magnetic pick up means associated with the second conveyor to sequentially raise the articles delivered to the first transfer zone into contact with the belt of the second conveyor and retain them in contact therewith during delivery to the second transfer zone, said magnetic pick up means comprising a body attached to the conveyor belt; a magnet carried by said body and having an outer face; a plunger carried by said body and having an inner free end and an outer end; and a spacer head at the outer end of the plunger normally closely overlying the outer face of the manget and movable away from said face on occasion to push an article out of the field of the magnet to release the article.

3,884,345
APPARATUS FOR PILING BOARDS

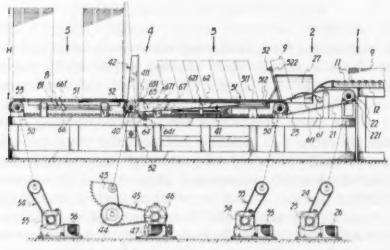
Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Co., Ltd, Osaka, Japan

Filed Feb. 8, 1973, Ser. No. 330,715

Claims priority, application Japan, Mar. 15, 1972, 47-26772

Int. Cl. B65g *57/00*

U.S. Cl. 198—35 **8 Claims**



1. An apparatus for stacking boards to a predetermined height which comprises, in combination, a feeding conveyor for successively introducing boards lying flat on said conveyor to the apparatus, vertically erecting conveyor means on which the boards are excitecd, extending downwardly from the feeding conveyor, a transporting conveyor for receiving and transporting the erected boards to the discharge end thereof, said transporting conveyor being provided with a board reclining support associated therewith near the end portion of the erecting conveyor for receiving and holding the boards while they are being conveyed on the transporting conveyor, a discharge conveyor for removing the boards from the transporting conveyor, a reversing gear comprising an L-shaped member rotatably disposed about the discharge end portion of the transporting conveyor, said L-shaped member containing a board erecting base and a board piling up base disposed at substantially right angles with respect to each other and adapted to be operatively cooperative with each other, said board erecting base being rotatable from a recessed position below the transporting conveyor to a substantially vertical position and said board piling up base being simultaneously rotatable from a substantially vertical position to a recessed position below the discharge conveyor, and means for rotating the board erecting base and the board piling up base.

3,884,346
CONVEYOR UNIT

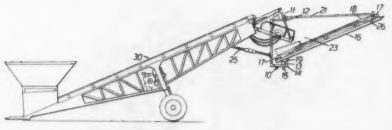
Patrick O'Neill, and Patrick Joseph Douglas, both of Dungannon, Northern Ireland, assignors to Powerscreen International Limited, Dungannon, Northern Ireland

Filed June 21, 1973, Ser. No. 372,293

Claims priority, application United Kingdom, June 22, 1972, 29399/72; Aug. 26, 1972, 39925/72

Int. Cl. B65g *37/00*

U.S. Cl. 198—99 **1 Claim**



1. A conveyor assembly comprising a main conveyor; an extension conveyor unit comprising an upright C-frame, a framework mounted on said C-frame and a conveyor mounted on said framework, said framework being pivotally mounted along an upright axis on the lower arm of the C-frame and connected to the upper arm by a brace, also pivotally mounted along said axis; attachment means mounting said C-frame to the off-loading end of said main conveyor, comprising a pivotal connection for pivotal movement of the C-frame relative to the main conveyor in a vertical plane and a length adjustable rod which is adjustable to pivot the C-frame relative to the main conveyor in said vertical plane.

3,884,347
APPARATUS FOR ORIENTING ARTICLES HAVING MAGNETIC PROJECTIONS

Ronald V. Gallagher, Lexington, and Robert R. Swanson, Clemmons, both of N.C., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 14, 1973, Ser. No. 425,029

Int. Cl. B65g *47/24*

U.S. Cl. 198—254 **11 Claims**

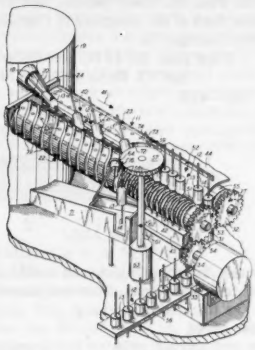
1. An apparatus for orienting an article having a body portion with magnetizable and nonmagnetizable poles, comprising:

a rotatable cylinder;

a surface extending adjacent to the rotatable cylinder and spaced from the rotatable cylinder to define a gap therebetween which is narrower than the body portion so that the article is supported between the cylinder and the surface;

means for creating a magnetic field in the gap to attract the magnetizable pole into the gap to thereby orient the

article; and



means for moving the oriented article in the gap upon rotating the cylinder to clear the gap to receive and orient a subsequent article.

3,884,348

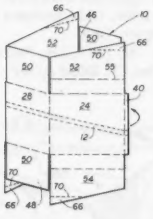
COMBINATION CARDBOARD SHIPPING AND DISPLAY CARTON

Donald R. Ross, 34 Ocean Ave., Amityville, N.Y. 11701

Filed May 22, 1974, Ser. No. 472,487

Int. Cl. B65d *5/48, 5/54, 81/00*

U.S. Cl. 206—45.12 **4 Claims**



1. A combination cardboard shipping and display carton comprising plural body panels in a medial location in said carton cooperating to define a shipping compartment for products, said body panels bounding opposing rectangular openings into said shipping compartment, a continuous tear strip disposed at an angular orientation and in encircling relation in said body panels so as to cause a division of said carton upon removal of said strip preparatory to display exposure of the products in said shipping compartment, and along the edges of each said rectangular opening a pair of opposing closure flaps sized to form a closure for said opening and a pair of opposing product-positioning flaps, each said product-positioning flap having a fold line spaced from said edge to delineate two portions therein, one said portion being adapted to fold in overlying relation to products positioned adjacent the body panel and the other portion having an operative position during shipping service of said carton projected at a right angle to said one portion along the sides of said products to minimize any shifting movements in said products within said shipping compartment, said last-named portion of said product-positioning flap terminating in an edge which is angularly oriented similar to said tear strip and sized to extend only into said shipping compartment to a location coincident with the location of said tear strip in said body panels, whereby the carton is separable along said tear strip with half the products in each separated carton portion and at least some part of said products in display position above the low side of the angularly oriented edges of the separated carton portion.

3,884,349

CONVERTIBLE DISPLAY DEVICE AND PACKING-BOX FOR ARTICLES

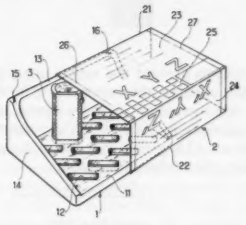
Hickel Charles, St Nom La Breteche, France, assignor to Compagnie Industrielle des Piles Electroniques "CIPEL", Levallois Perret, France

Filed Aug. 20, 1973, Ser. No. 389,442

Claims priority, application France, Aug. 21, 1972, 72.29822

Int. Cl. B65d *5/04, 5/52*

U.S. Cl. 206—44 R **7 Claims**



1. Article display package comprising an article-carrying support, a parallelepiped removable protective sleeve mountable on the support to enclose articles carried on said support, said sleeve having on at least two consecutive outer surfaces a separate publicity message, the said sleeve being scored along two of its longitudinal edges so that on removable from the support said sleeve may be flattened by folding solely along said scored longitudinal edges, so as to form a flat publicity panel one side of which comprises the said two publicity messages, said support comprising a base on which said articles are carried and an upstanding lateral wall, said wall having vertical slots, each for accommodating at least one portion of each of the lateral edges of the panel resulting from folding of said sleeve, said edges serving thus for fastening the said panel on the said wall so that only a single message at one time will be visible opposite the articles carried by the support and oriented so that such message can be interpreted directly by a viewer.

3,884,350

PACKAGING CARTON

Sten Gunnar Johansson, Vimmerby, Sweden, assignor to Aktiebolaget Ifoverken, Bromolla, Sweden

Filed Nov. 17, 1972, Ser. No. 307,496

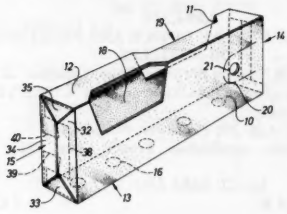
Claims priority, application Sweden, Nov. 15, 1971, 14599/71

Int. Cl. B65d *5/10, 75/58, 85/42*

U.S. Cl. 206—44.12 **4 Claims**

1. A parallelepipedic packaging carton having at one side four flaps extending, from respective ones of four edges which together define a rectangle, obliquely into the interior of the container leaving a substantial opening at the center of said one side, each of first and second of the flaps which extend from opposite ones of said edges having, proceeding from the root of the flap towards its tip, a sudden reduction in width whereby two shoulders are formed at opposite extremities of said width and each of the other flaps, proceeding from the root of the flap towards its tip, having a progressive reduction in width followed by a sudden increase in width where there are two ears extending away from one another, said flaps

interlocking with one another to prevent any flap swinging out of the carton, said first and second flaps being displaceable inwardly by an article wider than said opening, passing through the opening into the carton, after which the opening automatically narrows by reverse movement of the first and



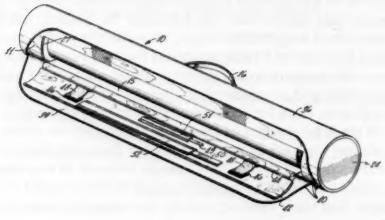
second flaps to prevent the article coming out of the carton through the opening, the carton being further distinguished in that that side thereof opposite the aforesaid one side is formed by four interlocking flaps which are substantially parallel to one another and together form an end wall perpendicular to four of the other sides of the carton.

3,884,351

DRAWING CASE FOR ARCHITECTS AND THE LIKE

Joseph W. James, 501 W. Whiting, Fullerton, Calif. 92632

Filed June 17, 1974, Ser. No. 480,209
Int. Cl. A45c *11/24*; **B65h** *15/48*; **G09f** *11/00*
U.S. Cl. 206—225 **7 Claims**



1. In a drawing case of the type including a rigid tubular body having a longitudinal slot therein, a self-winding spring-roller having an elongate sheet mounted therearound, bracket means connected to the inside of said tubular body, at the opposite ends thereof, for supporting the ends of said roller to permit said sheet to reciprocate through said slot in said body, and first and second plugs mounted in the ends of said body for sealing same, the improvement comprising:

a heavy, waterproof, sheet-like cover surrounding said body, said cover having a longitudinal slit therein adjacent one side and the ends of said slot in said body thereby forming a flap in said cover providing access to said slot;

means for releasably attaching said flap to said cover to enclose said slot in said body; and

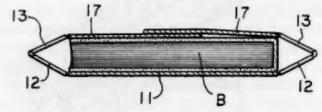
an elongate, arcuate panel having approximately the same thickness as said tubular body and having the same dimensions as said slot therein, said panel being mounted on the inside surface of said flap so as to extend into said slot, coplanar with said body, thereby sealing said slot when said flap is attached to said cover.

3,884,352

BOOK MAILER

William M. Pilz, III., Carol Stream, and Jeffrey M. Gardner, Wheaton, both of Ill., assignors to Container Corporation of America, Chicago, Ill.

Filed June 10, 1974, Ser. No. 477,652
Int. Cl. B65d *5/02*, *85/54*
U.S. Cl. 206—424 **3 Claims**



1. A mailer for a flat object such as a book or the like, said mailer being formed from a cut and scored blank of paperboard or the like and comprising:

a. a base panel;

b. first and second pairs of cell forming panels foldably connected to each other and to opposed edges of said base panel;

c. closure panels foldably connected to said second cell forming panels and being folded and secured together to define a flattened tube with said base panel and said cell forming panels;

d. end closure flaps foldably connected to said base panel and having converging side elements at their ends;

e. additional end closure flaps foldably connected to said closure panels and having converging side elements at one of the ends of each;

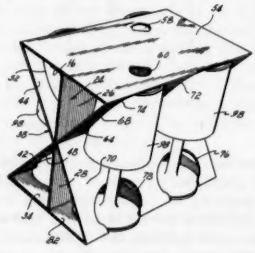
f. said first and second cell forming panels a transverse sectional configuration corresponding to the convergence of the side elements of said end closure flaps.

3,884,353

X-SHAPED CARTON

Robert L. Forte, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Mar. 20, 1974, Ser. No. 452,722
Int. Cl. B65d *85/44*
U.S. Cl. 206—426 **7 Claims**



1. A carton for glassware or the like, comprising:

a central divider wall having upper and lower edges and a score line parallel to and midway between said upper and lower edges,

a top wall and a bottom wall each medially attached to said divider wall at the respective edges thereof, said top wall and said bottom wall being parallel to each other and generally perpendicular to said divider wall, and

a pair of side walls on opposite sides of said divider wall, each having upper and lower margins which are foldably attached to said top wall and said bottom wall respectively, each said side wall including an upper portion and a lower portion flexibly joined together along a central fold line parallel to said score line, each said side wall having a dimension between said upper and lower mar-

gins which is greater than the height of said divider wall, each said side wall being bent at said fold line to form a V, the V formed by each side wall being invertable between a collapsible position in which it opens inwardly toward said central divider wall, across a center position to an erected position in which it opens outwardly,

said divider wall being foldable along said score line by bringing said upper and lower edges toward one another when said side walls are in the said collapsible position, said upper portions and said lower portions including openings to hold glassware therebetween when said side walls are in said erected position.

3,884,354

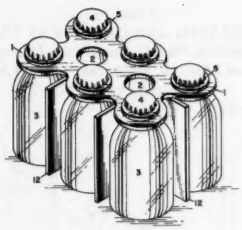
PACKAGE FOR BOTTLES

Karl R. Guenther, Middleton, and Elmer G. Paquette, Madison, both of Wis., assignors to Bjorksten Research Laboratories, Inc., Madison, Wis.

Continuation of Ser. No. 89,646, Nov. 16, 1970, abandoned. This application May 26, 1972, Ser. No. 257,463

Int. Cl. B65d *71/00*

U.S. Cl. 206—427 **14 Claims**



1. In a package comprising a plurality of crowncapped necked bottles and carrying means therefor, the combination of

flat plate carrying means,

said flat plate provided with circular apertures which receive said bottle necks,

each of said apertures having a diameter greater than the diameter of said necks and crown-caps,

retaining members,

said retaining members being altogether independent of said flat plate carrying means,

each of said retaining members received on one of said bottle necks,

each of said retaining members being freely disengageable upwardly from contact with said flat plate carrying means,

each retaining member being at least slightly elastomeric,

each of said retaining members being a flat annular member having an outer peripheral edge which is round or circular and smooth, being substantially devoid of projections, and which is greater in diameter than the diameter of the apertures in said flat plate carrying means, and

having an inner peripheral edge which is round or circular and smooth, being substantially devoid of projections, and which is lesser in diameter than said crown-cap and lesser in diameter than the neck portion immediately below said crown-cap and which is stretched to the diameter of neck portion below said crown-cap by said neck portions on which it is received.

3,884,355

PROTECTIVE SEAT COVER OF THIN PLASTICS FILM OR SHEET, A PACKAGE FOR THE PROTECTIVE SEAT COVER AND LIKE THIN PLASTICS ARTICLES, AND A PROCESS OF MAKING THE PACKAGE

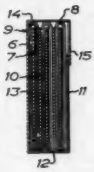
Bengt Herman Eriksson, Bromma, Sweden, assignor to AB R. W. Nissen, Stockholm, Sweden

Filed Jan. 27, 1972, Ser. No. 221,208

Claims priority, application Sweden, Feb. 12, 1971, 1777/71

Int. Cl. B65d *71/00, 83/08, 85/62*

U.S. Cl. 206—494 **4 Claims**



1. A package containing a great many protective seat covers or similar at least substantially rectangular articles of thin plastics or like material, wherein the package comprises a rectangular container suitably of cardboard, corrugated board or like material and containing a number of bundles of the thin plastics articles, a plurality of plates fitted in said container, each bundle is doubled about said plate, the doubled bundles placed in juxtaposition with the folds facing upwardly in the container, and others of said plates are interleaved with the doubled bundles.

3,884,356

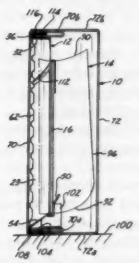
PACKAGING METHOD AND CONSTRUCTION

Edward J. Lidgard, 1103 Kingston Rd., Perry, Ga. 31069

Filed Aug. 14, 1972, Ser. No. 280,647

Int. Cl. B65d *85/48, 5/50*

U.S. Cl. 206—521 **9 Claims**



1. A packaging assembly for containment and protection of an article comprising

a carton having side walls and at least one open end operable to be closed by flaps formed integrally with at least some of the walls,

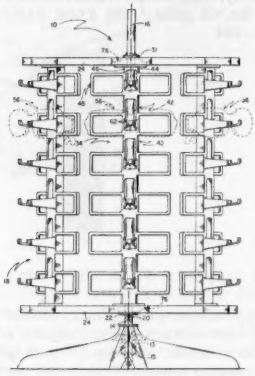
a support structure inserted in said carton, said structure having means securing an article thereto and at least one locking element extending therefrom, and

one carton flap being folded upon itself to embrace said locking element in reverse fold relationship thereby retaining said support structure against movement in said carton.

3,884,357
SUNGLASS DISPLAY STAND

Jack Bloch, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.

Filed Jan. 11, 1971, Ser. No. 105,445
Int. Cl. A47f *5/02, 7/02*
U.S. Cl. 211—13 **4 Claims**



1. A rotary display stand for sunglasses or spectacles having temples comprising:

a. a pedestal;

b. an axial shaft extending substantially vertically upwardly from said pedestal;

c. a rotatable sunglass display rack for supporting a plurality of sunglasses and being mounted upon said axial shaft for rotation thereon;

d. said rack comprising a pair of end members, each having an opening for said axial shaft to pass through, and portions extending outwardly from said opening;

e. said end members having a plurality of slots therein spaced about the periphery thereof each at a predetermined minimum distance from said opening, each of said slots formed by interior walls of said end members and having a wide entrance portion which progressively narrows for a distance and then widens abruptly from its narrowest portion to form lip means which include a pair of substantially horizontal lips on said interior walls on either side of said slots;

f. a plurality of display rack segments each having an attachment portion at each end thereof, each attachment portion being shaped for manual insertion in one of said slots opposing each other in a pair of aligned end members, each of said attachment portions comprising a narrow outermost portion which progressively widens for a distance and then narrows abruptly from its widest portion to form locking ledge means which include a pair of substantially horizontal locking ledges, said attachment portion being a unitary solid element so that a section taken through any part thereof will show a continuous solid cross-section of material, the pair of substantially horizontal locking ledges being engaged by the pair of substantially horizontal lip means formed in the walls of said slots for permanently attaching said rack segments to said end members;

g. said rack segments each having portions for supporting a plurality of sunglasses thereon for display comprising;

h. an elongated vertically oriented stem member;

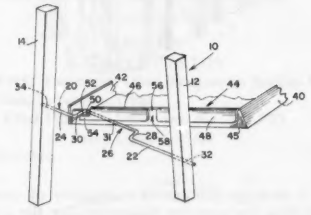
i. a plurality of sunglass temple engaging supporting members extending outwardly from opposite sides of said stem member, each of said temple engaging support members including a pair of spaced substantially horizontal members including an upper and lower member extending from each side of said stem member and a substantially vertically extending member connecting the pairs of substantially horizontal members, a substantially large four-sided opening enclosed by said substantially horizontal and vertical members and a portion of said stem members, the opening being of considerably greater area than the ends of the temple portions to be inserted therethrough, said lower substantially horizontal members on each side of said stem member supporting the sunglass temples and the substantially vertical members serving as cam means to cam the sunglass temples into their substantially, space saving, at least partially closed position as the sunglasses are inserted into said temple engaging support members for display on said stand;

j. a plurality of sunglass front frame supporting members extending forwardly from said stem member, each of said front frame supporting members comprising an elongated forward extending ledge and abutment means comprising a pair of spaced side members extending upwardly on either side of said ledge and extending only a portion of the length thereof and forming a shoulder at each end of said spaced side members which engage spaced portions of the sunglass front frame portions on either side of a bridge portion of said front frame portions for limiting the inward motion of said sunglasses on said display stand.

3,884,358
SHELVING AND/OR DISPLAY UNIT

Howard J. Marschak, 865 W. North Ave., Chicago, Ill. 60622

Filed Mar. 18, 1974, Ser. No. 451,891
Int. Cl. A47f *5/00*
U.S. Cl. 211—148 **8 Claims**



1. A display or shelving unit comprising a pair of spaced uprights, each of said uprights having spaced front and rear legs, a shelf support member extending between said front and rear legs of each said upright, each said shelf support member having an offset portion which is of generally U-shaped configuration and is intermediate said front and rear legs, a shelf having a downwardly extending flange on each of its opposite sides which extends laterally of the shelf, said flange having a pair of spaced hooking members which interlock with the front and rear ends of said offset portion of said shelf support member to detachably lock said shelf to said shelf support member to prevent the forward and rearward movement of said shelf with respect to said shelf support members.

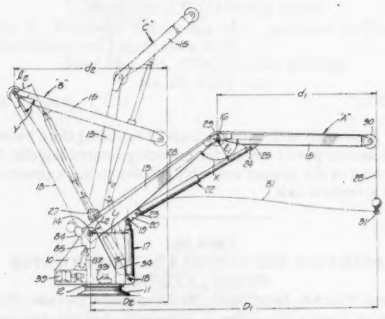
3,884,359
LEVEL LUFFING CRANE

Don Suverkrop, Bakersfield, Calif., assignor to Hopper, Inc., Bakersfield, Calif.

Continuation-in-part of Ser. No. 779,403, Nov. 27, 1968. This application Aug. 26, 1970, Ser. No. 66,969
Int. Cl. B66c *23/54*
U.S. Cl. 212—35 **15 Claims**

1. An articulated crane, comprising in combination: a base member, an inner boom, pivot means mounting said inner boom on the base member, an outer boom pivotally mounted

on the inner boom, means including a first extensible hydraulic cylinder assembly for independently swinging said inner boom with respect to said base member in an arc on both sides of the vertical position, said assembly defining a first effective lever arm with respect to said pivot means, means including a second extensible hydraulic cylinder assembly for independently swinging said outer boom with respect to said inner boom, said second assembly defining a second effective lever arm with respect to the pivotal mounting of the outer boom, said booms being movable in a traverse from an extended position in which the inner boom inclines upward on one side of the vertical and the outer boom extends further to the same side thereof and the angle between the booms being less than 180 degrees, to a retracted position in which the inner boom inclines upward on the other side of the vertical and the outer boom extends to the first mentioned side thereof, the positions of the booms, hydraulic cylinder assemblies, and pivotal connections being such that



$$\frac{D_1}{D_2} \cong \frac{L_1}{L_2} \times \frac{l_2}{l_1}$$

where:

D_1 = horizontal reach of the booms when extended

D_2 = horizontal reach of the booms when retracted

L_1 = effective lever arm of said first hydraulic cylinder assembly extended

L_2 = effective lever arm of said first hydraulic cylinder assembly retracted

l_1 = effective lever arm of said second hydraulic cylinder assembly extended

l_2 = effective lever arm of said second hydraulic cylinder assembly retracted

the cylinder assemblies being sized according to the relation

$$P_1V_1 \cong P_2V_2$$

where:

P_1 = unit pressure in first hydraulic cylinder assembly at a given instant

P_2 = unit pressure in second hydraulic cylinder assembly at the same instant

V_1 = displacement volume of the first hydraulic cylinder assembly during said traverse

V_2 = displacement volume of the second hydraulic cylinder assembly during said traverse

and hydraulic means interconnecting said hydraulic cylinder assemblies to coordinate their simultaneous action to cause the outer end of the outer boom to move substantially horizontally and above the level of said pivot means.

3,884,360

COUPLING-UNCOUPLING MEANS USING A LEVER OPERATED BY AN AXLE-MOUNTED DISC

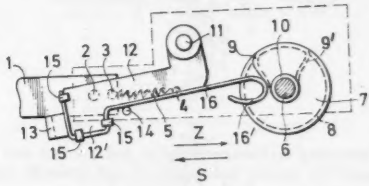
Max Ernst, Lahengrinstr. 14, Nuremberg, Germany

Filed Jan. 31, 1974, Ser. No. 438,477

Claims priority, application Germany, Feb. 1, 1973, 2304861

Int. Cl. A63h *19/18*

U.S. Cl. 213—75 TC **6 Claims**



1. In combination with a toy rail vehicle, a coupling system for coupling and uncoupling toy railroad vehicles, said system including a control disc fixedly connected to a wheel axle of said rail vehicle, said control disc having oppositely facing end wall portions, a coupling including a shank having a rear portion pivotally supported by said rail vehicle, control lever means including a lever pivotally supported by said rail vehicle and operatively connected to said rear portion and operable to move said rear portion into a first position in which said coupling is in engaged position and into a second position in which said coupling is in its disengaged position, said control lever means including spring arm means fixed to said lever, said spring arm means having a rounded head portion adapted to be slightly pressed against either one of the end wall portions of said control disc, and said control disc being provided with peripheral guiding means leading from one end wall portion to the other end wall portion of said control disc and slidingly engaging said rounded head, said control disc, through said peripheral guiding means, being operable in response to a change in the direction of rotation of said axle and thereby of said control disc to pivot said control lever means and shank and to shift said head from one of said end wall portions to the other one of said end wall portions.

3,884,361

ARTICLE TRANSFER APPARATUS

Elbert Edward Botterill, St. Albans, England, assignor to The Metal Box Company Limited, London, England

Filed Jan. 15, 1973, Ser. No. 323,717

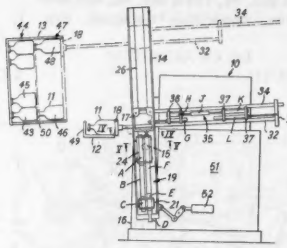
Claims priority, application United Kingdom, Jan. 19, 1972, 2513/72

Int. Cl. B65b *35/30*

U.S. Cl. 214—1 BT **12 Claims**

1. Transfer apparatus for selectively transferring each of a succession of articles or batches of articles from a first location to selected ones of second locations or vice versa, said apparatus comprising a support, an article engaging member, and a plurality of actuating means in excess of two connected to one another and between said support and said article engaging member, each of said actuating means being of the type having a positive stroke for moving said article engaging member a predetermined linear distance relative to said support, the individual and cummulative strokes of selected ones of said actuating means corresponding to the spacing of said second locations from said first location, and control means for selectively actuating said actuating means for moving said article engaging member between selected ones of said second locations and said first location, said article engaging member and said plurality of actuating means defining a first actuating system and said support being carried by a second actuating system movable in a direction generally transverse to the

general direction of movement of said first actuating system, and said second actuating system including a further plurality



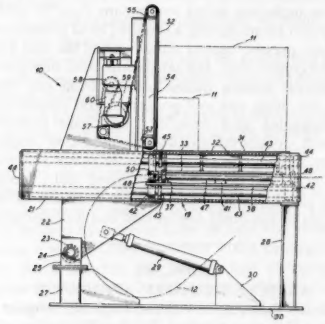
of actuating means connected to one another and to said support for moving said support in said generally transverse direction.

3,884,362

UPENDER FOR VARIABLE SIZES OF PRESSURE-SENSITIVE PAPER ROLLS

Lawrence A. Brenner, Brookfield, Wis., and Elmer Bryant, Downingtown, Pa., assignors to Beloit Corporation, Beloit, Wis.

Filed Sept. 17, 1973, Ser. No. 397,943
Int. Cl. B65g *7/00*
U.S. Cl. 214—1 Q **10 Claims**



1. Apparatus for upending rolls of pressure-sensitive sheet material, comprising:

a pivotal carriage having thereon a normally inactive upwardly extending discharge conveyor and means supporting a plurality of roll-engaging and supporting arms below the lower end of the conveyor, whereby a roll to be upended is adapted to be delivered on a generally horizontal axis and with its leading end contiguous to the discharge conveyor and its perimeter in position to be engaged by said arms; and

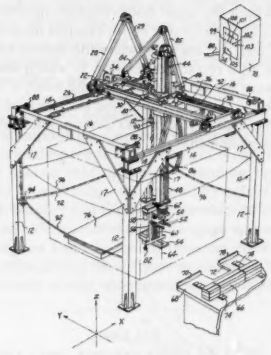
means mounting said arms on said carriage for movement relative to said discharge conveyor and the carriage into selective extended position relative to said discharge conveyor in correlation to the length of the roll to be upended without interfering with a next succeeding roll relatively closely spaced from the trailing end of the roll to be upended, and for selectively adjusting the arms in correlation to the diameter of the roll to be upended to effect uniform lifting engagement with the perimeter of the roll, so that the roll can be upended onto the discharge conveyor by pivoting the carriage to swing said arms upwardly and said discharge conveyor downwardly in unison.

3,884,363

PROGRAMMABLE UNIVERSAL TRANSFER DEVICE

Nadim S. Ajlouny, West Bloomfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sept. 13, 1973, Ser. No. 397,036
Int. Cl. B65g *57/20*
U.S. Cl. 214—1 BB **25 Claims**



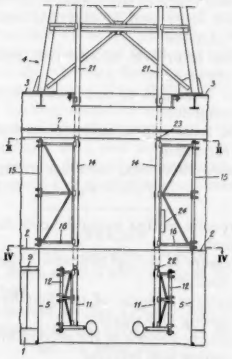
24. Apparatus as defined in claim 23 including third bidirectional motive power means for providing limited angular displacement of the gripper assembly relative to the support arm about a vertical axis.

3,884,364

APPARATUS FOR CONNECTING UNDERWATER INSTALLATIONS

Bernard Mercier, Saint Maur, and Francisco Serrano, Paris, both of France, assignors to Subsea Equipment Associates Limited (SEAL), Hamilton, Bermuda

Division of Ser. No. 299,551, Oct. 20, 1972, Pat. No. 3,817,412. This application Dec. 3, 1973, Ser. No. 420,801
Claims priority, application France, Oct. 21, 1971, 71.37808
Int. Cl. E21b *3/00*
U.S. Cl. 214—1 R **15 Claims**



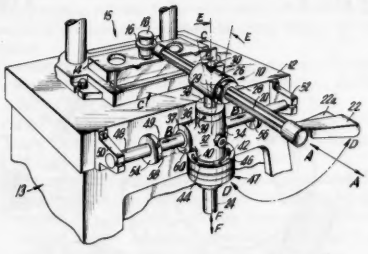
1. An apparatus for unloading underwater devices from an installation on the water surface subjected to the action of ground swells and waves comprising;

a. a storage area within said installation, for storing said underwater devices,
b. a well extending vertically through said installation in the storage area,
c. a deck above the storage area, having an opening therethrough in alignment with said well,
d. a derrick located on said deck coaxially above said well,
e. a linearly reciprocating platform located below said deck capable of adopting at least a first position within said storage area and a second position within said well such that said underwater device may be placed on the upper surface of said platform,
f. means to attach said underwater device to said platform,
g. means to transport said underwater devices from said storage area to said platform, when said platform is in its second position, said means being movable from a position within said storage area to a position within said well,
h. lower vertical guides in said well below the level of the platform, and
i. upper vertical guides in said well in alignment with the lower guides above the level of the platform.

3,884,365
WORKPIECE MANIPULATOR

John B. Thomson, Manhasset, N.Y., assignor to Thomson Industries, Inc., Manhasset, N.Y.

Filed Mar. 19, 1974, Ser. No. 452,655
Int. Cl. B25j *1/12*
U.S. Cl. 214—1 CM **14 Claims**

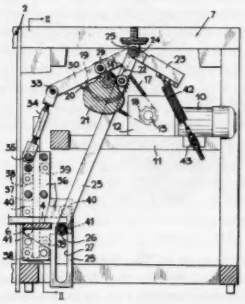


1. A workpiece manipulator for manipulating a tool to grip a workpiece, comprising:
an arm for receiving said tool including means for actuating said tool to grip said workpiece;
a vertical member, said vertical member including means mounting said arm for reciprocatory movement laterally relative to the axis of said vertical member;
a transverse member; and
means connecting said vertical member and said transverse member, said connecting means being movable both horizontally reciprocally along and rotationally about said transverse member and also being movable vertically reciprocally along said vertical member while permitting said vertical member to rotate about its longitudinal axis, whereby said manipulator arm may be independently moved in any one or more of vertical, horizontally lateral, and horizontally in and out directions, as well as rotatably about its own longitudinal axis and pivotally about each of said vertical and transverse members.

3,884,366
PALLETISING OR DEPALLETISING MAGAZINE

Antoine Joseph Leenaards, Lausanne, Switzerland, assignor to Crown Cork & Seal Co. Inc., Philadelphia, Pa.

Filed Jan. 2, 1973, Ser. No. 320,498
Claims priority, application Belgium, Jan. 11, 1972, 777899
Int. Cl. B65g *59/06*
U.S. Cl. 214—6 BA **13 Claims**

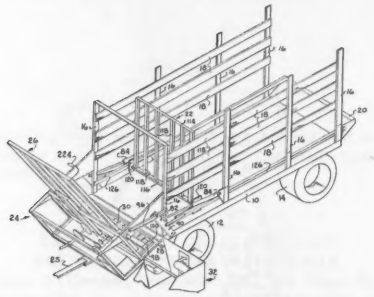


1. A palletising or depalletising magazine serving to contain a stack of superimposed pallets whereof the lower pallet is carried by retractable co-planar substantially horizontally disposed support means and can be placed on a conveyor so as to be individually removable; a displaceable carriage having first guide means to confine the displacement thereof to a first direction, and having second guide means for receiving said retractable support means;
said retractable support means having extending therefrom a plurality of elongate forks adapted to extend under the final lower pallet a distance greater than half the dimension of the pallets as measured in a direction parallel to the elongate dimension of the forks;
a first rigid member coupled to said carriage to periodically effect the displacement thereof in said first direction;
a second rigid member coupled to said support means for periodically effecting the displacement thereof in a second direction; and
common drive means coupled to said first and said second members for operating said members in a predetermined sequential relationship whereby said forks are successively;
lowered into the palletising or depalletising magazine to bring the stack of pallets onto the conveyor which is then stationary;
removed from the final lower pallet resting on the conveyor at only one side of the stacks; and
reintroduced into the palletising or depalletising magazine at the one side of the stack at the level of the penultimate lower pallet and raised in the palletising or depalletising magazine to then carry the penultimate lower pallet and to raise it as well as the remaining pallets;
the said final lower pallet remaining alone on the conveyor which can then be operated, whereby the forks can again be displaced in the same manner to perform identical cycles.

3,884,367
MECHANICAL DRIVE FOR A RECEIVING TABLE ON A BALE WAGON

Lee D. Butler, Kingsburg; Raymond E. Fisher, Reedley, both of Calif., and Albert D. Fontrier, Rhode St., Genese, Belgium, assignors to Sperry Rand Corporation, New Holland, Pa.

Division of Ser. No. 139,802, May 3, 1971, abandoned. This application Sept. 4, 1973, Ser. No. 393,867
Int. Cl. B65g *57/32*
U.S. Cl. 214—6 B **5 Claims**



1. In a bale wagon of the type which includes a frame, a receiving table mounted on said frame and capable of receiving a predetermined number of bales thereon and capable of being moved between a lower, bale-receiving position and an upper, bale-discharge position, and a transfer table mounted on said frame and capable of receiving said bales from said receiving table when said receiving table is at its bale-discharge position, the improvement which comprises:

a mechanical drive assembly mounted on said frame for moving said receiving table between its said positions and capable of being coupled to an external source of power and continuously driven thereby, said drive assembly being normally inoperatively uncoupled from said receiving table prior to each time when said bales have been received on said receiving table at its bale-receiving position, said drive assembly being operatively mechanically coupled to said receiving table each time after said bales have been received on said receiving table at its bale-receiving position and causing movement of said receiving table through only one complete cycle from its bale-receiving position, to its bale-discharge position and back to its bale-receiving position.

3,884,368
PANEL DESTACKER

Robert L. Ballard, 2205 Heather Street S.E., Grand Rapids, Mich. 49506

Filed Apr. 23, 1973, Ser. No. 353,245
Int. Cl. B65g *59/04*
U.S. Cl. 214—8.5 D **9 Claims**

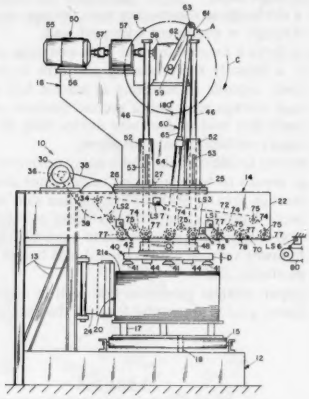
1. A panel destacking machine comprising:

means for supporting a stack of panels;

a destacker head including means for gripping the outermost panel of said stack of panels;

means guidably supporting said destacker head for reciprocating movement toward and away from said stack of panels; and

drive means for reciprocating said destacker head toward and away from said stack of panels, said drive means including a drive motor, an output drive shaft coupled to said drive motor, a crank arm coupled to said drive shaft to be rotated thereby, and a compressible link rotatably coupled to an end of said crank arm remote from its coupling to said drive shaft, and an opposite end of said linkage is pivotally coupled to said destacker head such that as the thickness of the stack of panels varies, the

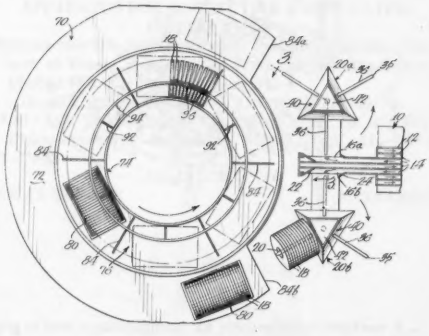


length of travel of said destacker head varies to compensate for the varying thickness of said stack.

3,884,369
METHOD AND APPARATUS FOR UNLOADING AND STORING REELS AND THE LIKE

Charles W. Tomlinson, Orange, Va., assignor to Acme Visible Records, Inc., Crozet, Va.

Filed Nov. 2, 1973, Ser. No. 412,491
Int. Cl. B65g *57/16*
U.S. Cl. 214—8 **5 Claims**



1. Apparatus for collection and storage of a plurality of objects having an aperture therein in a fixed location comprising conveyor means for moving said objects in an upright position along a given path to an unloading location, collection means spaced on one side of said unloading location, said collection means having at least two sloping arms adapted to engage through the aperture of each object at said unloading location, support means for supporting the lower ends of said arms in a spaced radial relationship, said support means being rotatable to move either of said arms into a position adjacent said unloading location, with the other arm being spaced away from said location, means for tilting each object over laterally toward said collection means at said unloading location, whereby to engage said object on said collection means, and storage means adjacent said collection means for storing a plurality of said objects, said storage means comprising a plurality of storage tiers mounted for rotation about a com-

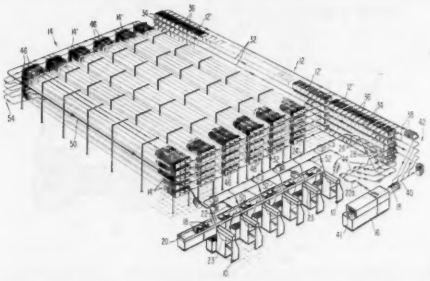
mon axis and being located adjacent to the other of said arms to facilitate the unloading of objects therefrom.

3,884,370

SYSTEM FOR SORTING AND PROCESSING ARTICLES INCLUDING FLAT MAIL PIECES

Robert S. Bradshaw; Alfred A. Greene, both of Broomall; James R. Hunter, Chadds Ford; S. James Lazzarotti, Broomall; Abe Mann, Bala Cynwyd, and Herbert L. Rosenblatt, Broomall, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sept. 28, 1973, Ser. No. 401,954
Int. Cl. B65g *43/00*
U.S. Cl. 214—11 R **12 Claims**



1. A system for sorting articles comprising in combination: carrier means coupled to said articles for providing support therefor and remaining therewith throughout the complete sorting process, each of said carrier means being comprised of a T-shaped upper section and a lower section for clamping at least one of said articles, said upper section having a spring-loaded clamp release lever protruding therefrom and being operatively connected to the clamping means in said lower section,

transport means for transporting said carrier means to predetermined sort destinations and providing storage therefor at said destinations,

escort memory means affixed to each of said carrier means and possessing information as to the sort destination therefor,

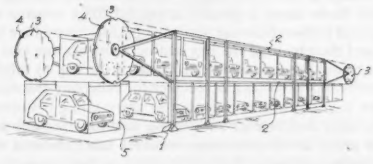
gating means operatively positioned with respect to said transport means and responsive to the information contained in said escort memory means for switching said carrier means among a plurality of transport paths to achieve said predetermined sort destinations.

3,884,371

MECHANISM FOR VARYING THE DISTANCE BETWEEN CAGES MOVABLE IN AN ENDLESS PATH

Patricio Coira Castro, Avda. Pio XII, 35, Pamplona, Spain

Filed Jan. 21, 1974, Ser. No. 434,901
Int. Cl. E04h *6/06*
U.S. Cl. 214—16.1 BB **3 Claims**



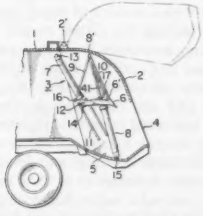
1. Improvements introduced into wheel transporting cages, with a mechanism for varying the distance between cages, of the type that consists of a supporting structure for a plurality of cages arranged in two super-imposed horizontal rows, very close together in the straight stretches, each cage being joined to a mechanism for varying distances between them, which mechanism produces an increase or a reduction of the separation between the said cages before or after their passage over the end pulleys of the wheel in either of the cases in which a cage begins its ascent towards the upper level, or its descent towards the lower level, following a curved line determined by the rim of the said pulleys, to avoid a cage being contacted by the cage immediately it in a straight line, the cages being hauled by branches of cable that link the respective distance-varying mechanisms constituted in the hangers of the cages, the said improvements are characterized because the distance-varying mechanism of each cage is integrated into a hanger of the cage in question, which hanger consists of a resistant profile arranged at right angles with respect to the direction of forward travel of the cages, and is fitted on the exterior with two cylindrical elements near the ends, designed to be joined to notches made in the rims of the driving pulleys; in the said hanger, provision has been made for two facing longitudinal grooves on the upper and lower zones, which grooves serve as guides for sliding elements constituted by two plates external to the hanger, each pair of plates being linked by two vertical bushing shafts passing through the grooves in such a way that the said plates can slide being perfectly guided by the facing grooves; one of these shafts of each sliding element is extended at both ends, each of which carries a sheave, while in the middle zone there is a pulley over which there passes the end of a branch of traction cable coming from another hanger immediate to it, which cable has previously passed through another pulley fitted on a fixed vertical shaft near the end of the hanger, to which hanger the end of the cable is anchored, so that a movement towards the centre of the sliding element will produce shortening of the branch of the cable fixed to a hanger that is immediate to it, while if the sliding element moves towards the end, the said branch will be lengthened, thus producing a greater distance between hangers.

3,884,372

REFUSE LOADER

Takehiko Kunii, c/o Kyokuto Kaihatsu Kogyo Kabushiki Kaisha, 1-45, 6-chome, Koshienguchi, Nishinomiya-shi, Hyogo-ken, Japan

Filed Oct. 30, 1972, Ser. No. 302,564
Claims priority, application Japan, May 8, 1972, 47-45199
Int. Cl. B65f *3/00*
U.S. Cl. 214—83.3 **3 Claims**



1. A refuse loader comprising, in combination, a storage compartment; a hollow tailgate structure adjacent to the rear end of said storage compartment; apparatus substantially mounted in said hollow tailgate structure for compressing and transferring refuse from an opening at the rear end portion of said tailgate structure to said storage compartment; a pair of rail members fixed to the side wall of said tailgate structure and substantially vertically elongated near the bottom of said tailgate structure; a sweep panel mounted in said tailgate structure with root end portion movable upwardly and downwardly along said rail members; a first hydraulic cylinder with free end portion pivotally connected to the root portion of

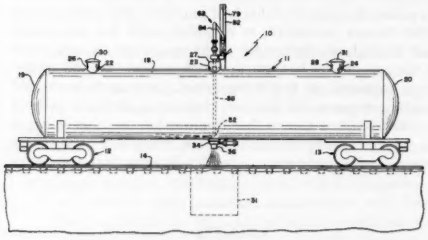
said sweep panel; a second hydraulic cylinder having one end pivotally supported by said tailgate structure at a bottom portion thereof; a first link member having one end pivotally connected to the free end portion of said second hydraulic cylinder and having the other end pivotally connected to a side wall portion of said tailgate structure; a second link member having one end pivotally connected to the tip side portion of said sweep panel and having the other end pivotally connected to the free end of said second hydraulic cylinder, the refuse loaded onto the bottom of said tailgate structure being compressed and transferred into said storage compartment by said sweep panel which is initially moved downwardly and vertically in horizontal attitude along said rail members by means of co-operation of said first and second hydraulic cylinders, said sweep panel being swung about a horizontal axis thereof by means of retracting movement of said first cylinder.

3,884,373

APPARATUS AND SYSTEM FOR UNLOADING RAILROAD TANK CAR

William R. Archibald, San Anselmo, Calif., assignor to Marcona Corporation, San Francisco, Calif.

Filed Mar. 22, 1974, Ser. No. 453,769
Int. Cl. B65g *53/30*
U.S. Cl. 214—83.28 **19 Claims**



1. Apparatus for unloading flowable solids material from a railroad car, the material characterized in being dispersible with a liquid to form a slurry, comprising the combination of a vessel mounted on the car, the vessel having a hollow interior together with an inlet opening and a discharge opening nozzle means carried within the vessel, supply conduit means carried within the vessel for supplying liquid to the nozzle means, said conduit means having an inlet end adapted to be connected with a source of liquid under pressure, actuating means for moving the nozzle means to direct the stream of liquid jetting therefrom through a path within the vessel to disperse and suspend the solids impacted by said stream to form a slurry, said inlet opening disposed on a top portion of the vessel and said discharge opening disposed on a lower portion of the vessel in vertical register with the inlet opening, said supply conduit extending within said vessel between said inlet and discharge openings and detachably supported in said inlet and outlet openings so as to be removably mounted from said vessel, and valve means for closing said discharge opening whereby the load of material can be transported within the vessel and for opening said discharge opening whereby said slurry can be discharged therethrough.

3,884,374

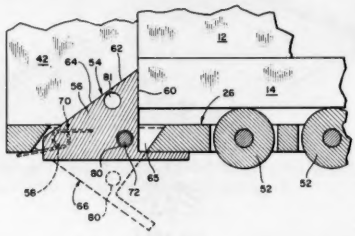
TRUCK LOADING SYSTEM

Albert J. Swallow, Jr., 1428 E. Lycoming St., Philadelphia, Pa. 19124

Filed Oct. 23, 1973, Ser. No. 408,792
Int. Cl. B60p *1/52, 7/06*
U.S. Cl. 214—84 **3 Claims**

1. In a truck loading system for use within a truck body having a floor and a ceiling, the combination of

A. a right roller conveyor and a left roller conveyor secured within the truck body,
1. said right and left roller conveyors being transversely spaced,
2. said right and left roller conveyors extending longitudinally within the truck body,
3 . the said roller conveyors each having a base and a plurality of longitudinally spaced rollers,
4. at least one said conveyor base including a well; and
B. an automatic pallet stop assembly associated with said one base,
1. said pallet stop assembly including a detent which is movable from a loading position to a locking position,
2. said detent being movable within the well,
3. said detent having pivotal movement within the well about a pin,



4. the said detent having an inclined surface which inclines upwardly from a plane drawn through the conveyor base, and a stop surface, said stop surface positioning at right angles to and extending above a plane drawn through the conveyor base,
5. the pallet stop assembly including a spring associated with the pin, the spring normally biasing the pallet stop assembly to the locking position,
6. the pallet stop assembly including a detent lock, said detent lock including a locking pin,
7. the detent being provided with an opening and the conveyor base being provided with a channel, the said opening aligning with the channel when the pallet stop assembly is in the locking position, the said locking pin inserting into the channel and opening to lock the pallet stop assembly in the said locking position.

3,884,375

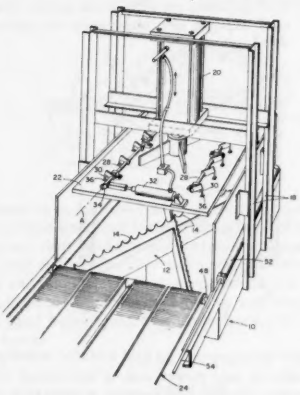
BAG OPENING AND EMPTYING WITH TRAVELING CONVEYOR

Charles Mandeville Schott, Jr., and Charles Mandeville Schott, Sr., both of Califon, N.J., assignors to Charles M. Schott, Jr.

Filed July 16, 1973, Ser. No. 379,484
Int. Cl. B65g *65/04*
U.S. Cl. 214—305 **4 Claims**

1. In a bag emptying machine comprising a fixed blade array disposed to engage a broad face of a bag, a presser having a bag-engaging surface generally opposed to the cutting edges of said blade array, a reciprocal presser drive constructed to press said presser facewise upon an opposite broad face of said bag and thereby urge the bag and contents against said blade array to cut the first mentioned face of the bag to release its contents and to retract, a receiver for receiving the contents of the bag and means operable to carry a bag between said blade array and presser and deliver said bag facewise to said blade array the improvement wherein said conveyor means comprises a conveyor belt and a conveyor belt guide member movable bodily carrying said conveyor belt from a first position spaced from said blade array to a second position overlying said blade array, said conveyor belt in the latter position being movable about said guide to convey a bag to said blade array, said conveyor belt guide thereupon being operable to

return toward said first position while progressively depositing said bag facewise directly upon the cutting edges of said blade array in position to be cut, and said bag emptying machine including means to lift an empty bag from the cutting edges of



said blade array while said guide is in said first position and to deposit said empty bag upon said conveyor belt when said guide is in said second position, said conveyor belt thereupon being operable to convey away said empty bag.

3,884,376

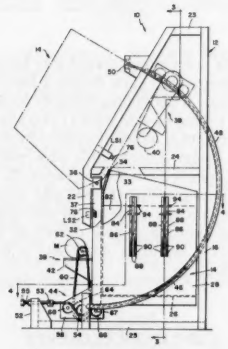
DUMPER

Charles F. Rivers, 15318 Warwick Rd., Detroit, Mich. 48223

Filed Mar. 4, 1974, Ser. No. 447,947

Int. Cl. B65g *65/04*

U.S. Cl. 214—314 **10 Claims**



1. A dumper comprising a supporting frame, a cradle, pivot means mounting said cradle on said frame for swinging movement from a loading position to an unloading position, and means for swinging said cradle from said loading position to said unloading position comprising a rack extending in an arc centered on the axis of swinging movement of said cradle, a pinion carried by said cradle in engagement with said rack, and power means on said cradle for rotating said pinion.

3,884,377

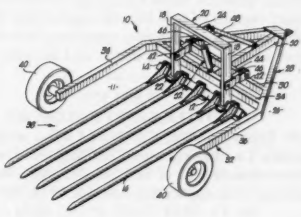
STACK MOVING IMPLEMENT

Adin F. Holdeman, Hesston, and Melvin V. Gaeddert, Newton, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Apr. 30, 1973, Ser. No. 355,932The portion of the term of this patent subsequent to May 20, 1992, has been disclaimed.

Int. Cl. E02f *3/00*

U.S. Cl. 214—767 **18 Claims**



1. A stack moving implement comprising:

an L-shaped stack carrying unit having a front transverse beam, a mast rigid to said beam and extending upwardly therefrom, and a plurality of spaced tines rigid to the beam and extending rearwardly therefrom;

a support carrying said unit including an arm at each side respectively thereof and a ground wheel for each arm respectively,

said tines normally resting on the ground between said wheels; and

an assembly for raising and lowering said unit with respect to the wheels including mechanism for tilting the unit to a position disposing the tines on an incline extending upwardly and rearwardly from the beam.

3,884,378

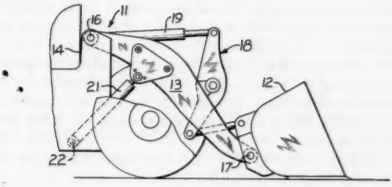
LIFT ARM ASSEMBLY FOR LOADER VEHICLES

Donald R. Muellner, Aurora, and Richard J. Piercy, Geneva, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 23, 1973, Ser. No. 408,667

Int. Cl. E02f *3/80*

U.S. Cl. 214—769 **3 Claims**



1. Lift arm mechanism for a loader vehicle which has an elevatable bucket for receiving and lifting material comprising:

a lift arm having first and second ends and having an intermediate section between said ends,

first pivot means for coupling said first end of said lift arm to said vehicle and providing for raising and lowering of said second end thereof,

means for attaching said bucket to said second end of said lift arm,

a pair of plates disposed adjacent said intermediate section of said lift arm each being at a separate side thereof and each having a lower portion extending below said lift arm,

a linear fluid motor having one end pivotally connected

to said vehicle and having an opposite end extending between said lower portions of said plates,

second pivot means coupling said opposite end of said fluid motor to said lower portions of said plates,

a pair of removable cross pins each being transpierced through said plates and said intermediate section of said lift arm at spaced apart positions along said intermediate section of said arm with one of said cross pins being situated closer to said first end of arm than said second pivot means and the other of said cross pins being closer to said second end of said arm than said second pivot means whereby stress forces are divided between spaced apart regions of said lift arm, and a pair of spaced apart supplementary cross pins extending between said lower portions of said plates below said lift arm.

3,884,379

BOTTLE SAFETY CLOSURE

William James Landen, Cheshire, Conn., assignor to Eyelet Specialty Co., Incorporated, Wallingford, Conn.

Continuation-in-part of Ser. No. 313,801, Dec. 11, 1972, abandoned. This application Apr. 16, 1973, Ser. No. 351,266

Int. Cl. B65d *55/02, 85/56;* **A61j** *1/00*

U.S. Cl. 215—221 **3 Claims**

1. In combination, a bottle including an externally threaded neck, an internally threaded cap having a skirt removably engageable to the threaded neck, a plurality of axially resilient locking projections non-rotatably carried on the outside of said neck beneath the threaded region and spaced from the base of said neck, said projections being in radial overlap with said skirt and being at angularly spaced locations about the axis of said neck, the open end of said skirt having a circumferentially extending downwardly directed series of teeth in one-way engageable relation with said locking projections near the closed relation of said cap and neck, the direction of one-way co-action being that of escapement in the thread-on direction and engagement in the thread-off direction, and said projections extending sufficiently radially outward of said cap in the closed position to enable finger-actuated disengagement of said locking projections from said teeth, whereby the cap may then be unthreaded, the effective separation of said locking projections being substantially a multiple χ of the pitch angle characterizing said series of teeth, divided by the number of said projections, where χ is an integer other than said number or a multiple thereof.

3,884,380

CONTAINER FOR HIGH POWER GENERATORS OF ELECTRONIC PHOTOFLASH APPARATUS

Claus Prochnow, Braunschweig, and Hans-Jürgen Berger, Wolfenbuttel, both of Germany, assignors to Rollei-Werke Franke & Heidecke, Germany

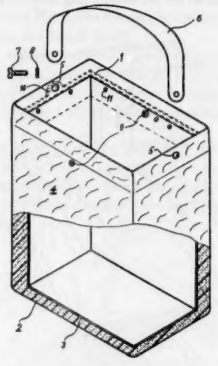
Filed Sept. 26, 1973, Ser. No. 402,533

Claims priority, application Germany, Sept. 28, 1972, 7235606

Int. Cl. B65d *25/10, 25/18, 25/32*

U.S. Cl. 220—9 F **8 Claims**

1. A container for a portable high voltage electronic flash power unit comprising a hollow body having side walls of foamed plastic material, a metallic bearing ring extending along said side walls embedded in the thickness thereof near the top edges thereof, means for attaching a carrying strap to said metallic bearing ring, and means for attaching a flash



power unit within the container to said metallic bearing ring so that the weight of said power unit is transferred to the carrying strap mainly through said metallic bearing ring rather than through said foamed plastic material.

3,884,381

NESTABLE COMPARTMENTALIZED TRAYS

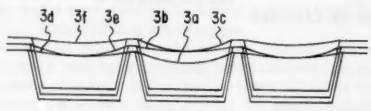
Gunther Kaupert, Thuringer Str. 1, D-5927 Erndtebruck, Westphalia, Germany

Filed Aug. 3, 1973, Ser. No. 385,240

Claims priority, application Germany, Aug. 4, 1972, 2238393

Int. Cl. B65d *21/02, 1/34*

U.S. Cl. 220—23.6 **3 Claims**



1. In a nestable compartmentalized tray having a plurality of cup-shaped depressions each having a base or lowermost wall portion and side walls sloping inwardly towards said base, two side-by-side extending side walls of two adjoining depressions being convergent in a direction away from the bases and terminating in a common connecting edge, whereby the tray has a plurality of common connecting edges; the improvement comprising the arrangement wherein said connecting edges are curved in the direction of the height dimension of said tray and wherein end-to-end adjoining curved connecting edges have alternatingly a relatively small and a relatively large radius of curvature.

3,884,382

CONTAINER CLOSURES

Martin Frank Ball, Welwyn Garden, England, assignor to The Metal Box Company Limited, London, England

Filed Jan. 4, 1973, Ser. No. 320,897

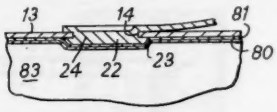
Claims priority, application United Kingdom, Feb. 9, 1973, 696/73

Int. Cl. B65d *31/00, 33/00*

U.S. Cl. 220—272 **9 Claims**

1. An easy opening container member comprising a wall having a dispensing opening therein, a closure of plastics material including a plug portion of an outline corresponding to the outline of said dispensing opening and an integral elon-

gated tab portion, said plug portion extending through said dispensing opening with said tab portion overlying an outer surface of said wall and tightly engaging said wall around said dispensing opening, said plug portion terminating in a rivet head in the form of a radially extending integral flange in molded engagement with an inner surface of said wall and retaining said plug portion in place, a layer of heat sealable



adhesive over said rivet head and surrounding adjacent portions of said wall inner surface, and a layer of metal foil underlying said rivet head and said surrounding adjacent portions of said wall and bonded thereto by said adhesive, said adhesive layer and said metal foil layer being molded in the area of said rivet head to define a receptacle for said rivet head, and said rivet head being molded in accordance with the molding of said layers.

3,884,383

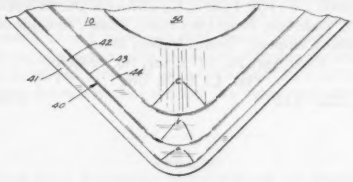
NESTING CONTAINER

Charles H. Burch, and Roger L. Medendorp, both of Grand Rapids, Mich., assignors to Kirkhof Manufacturing Corporation, Grand Rapids, Mich.

Continuation of Ser. No. 76,395, Sept. 29, 1970, abandoned. This application Jan. 17, 1973, Ser. No. 324,346

Int. Cl. B65d *1/46, 1/26*

U.S. Cl. 220—72 **5 Claims**



1. A polygonal, polymeric container having a plurality of sides and a bottom forming a polyhedron, the improvement in said container comprising: a stepped rim at the top thereof formed by first and second generally vertical surfaces joined by a first generally horizontal surface, and a third generally vertical surface joined to said second generally vertical surface by a second generally horizontal surface; said first surface being the outermost, said third surface being innermost and said second surface being intermediate, relative to said container; said first, second and third generally vertical surfaces being curved at the corners of said container, with the radius of curvature for each surface being different whereby collapsing of the container at these corners is resisted.

3,884,384

CONTAINER

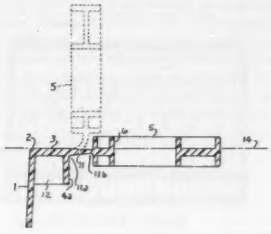
Harold S. Cloyd, Erie, Pa., assignor to Nosco Plastics, Incorporated, Erie, Pa.

Filed Dec. 26, 1972, Ser. No. 318,669

Int. Cl. B65d *25/28*

U.S. Cl. 220—94 A **2 Claims**

1. A container having an upwardly extending peripheral side wall terminating at its upper edge in a rim, rigid handles on opposite sides of the container, each handle having a rigid frame spaced from and extending outward from a portion of the rim, said frame having a first member closer to said portion of the rim and a second member farther from the said portion of the rim and providing a hand hold, said portion of the rim having outwardly and downwardly extending flanges with the downwardly extending flange outermost, a flexible hinge member bridging the space between and joined to said downwardly extending flange and to said first member, said first member and said downwardly extending flange being



straight and parallel to each other in plan view, said side wall, rim, handles and hinge sections comprising a single piece of plastic, each handle and its associated hinge member and portion of the rim having a parting line substantially in a common plane and vertical ribs extending between and joined to said side wall and said flanges.

3,884,385

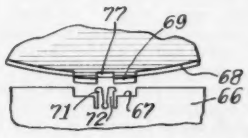
APPARATUS FOR LOCKING END BELLS TO A SHELL OF AN ELECTRIC MOTOR

Edward J. Schaefer, Bluffton, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Filed July 9, 1973, Ser. No. 377,215

Int. Cl. B65d *41/12*

U.S. Cl. 220—309 **2 Claims**

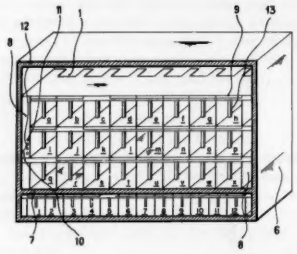


1. A housing for an electric motor, comprising a cylindrical shell, a plurality of axially extending notches formed in at least one end of said shell, an end bell having a plurality of radially extending locating tabs formed thereon, said end bell being positioned over said one end of said shell with each of said locating tabs being positioned in one of said notches, and said shell further having at least two deformable preformed holding tabs formed thereon adjacent said locating tabs, said holding tabs extending in opposite circumferential directions over said locating tabs and thereby locking said shell and said end bell in assembled relation and holding said end bell against circumferential movement relative to said shell, said holding tabs being formed at approximately the center of said notches, and said locating tabs having slots for receiving said holding tabs.

3,884,386
DEVICE FOR AUTOMATICALLY SUPPLYING DRINKS AND FOODSTUFF

Francisco Arin Urcola, Zumalacarregui 10, Tolosa, Spain

Filed July 27, 1973, Ser. No. 383,149
Claims priority, application Spain, July 29, 1972, 405376
Int. Cl. G07f 11/00
U.S. Cl. 221—7 11 Claims



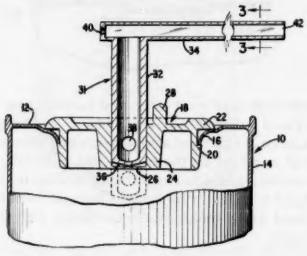
1. A device for storing and dispensing a plurality of different foodstuffs, such as bottled drinks and the like, said device comprising:
a cabinet;
said cabinet having therein a foodstuffs storage zone, said foodstuffs storage zone being divided into a plurality of separate receptacle means parallelly arranged in horizontal rows, each for storing therein an individual foodstuffs unit;
said cabinet having therein an electric energy zone adapted to be connected to a source of electric energy;
selectively operable and adjustable mechanical blocking means movably mounted at the front of each of said receptacle means for selectively blocking the removal from each of said receptacle means of the foodstuffs unit stored therein, said mechanical blocking means comprising a plurality of members mounted to slide horizontally along each of said horizontal rows of receptacle means, the number of said members in each of said rows being equal to the number of receptacle means in said each row, less one;
selectively controllable electric blocking means separate from said mechanical blocking means and connected to said electric energy zone for selectively blocking the removal from any of said receptacle means of the foodstuffs unit stored therein and for blocking such removal upon the failure of said source of electric energy;
detection means associated with each of said receptacle means for detecting the removal therefrom of the respective foodstuffs unit and generating a signal representative thereof; and
said cabinet having therein a registering zone operatively connected to said electric energy zone and to said detection means for receiving therefrom said signal representative of the removal of any of said foodstuffs units.

3,884,387
POURING SPOUT FOR LIQUID CONTAINERS

Osvaldo Vannucci, Sao Paulo, Brazil, assignor to American Home Products Corporation, New York, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,489
Int. Cl. B67b 7/26
U.S. Cl. 222—83 4 Claims

1. A dispensing container for liquids comprising:
A. A container having an orifice defined in it;
B. A closure sealably connected to said orifice;
1. A conduit defined in said closure adapted to receive a pouring spout;
2. A frangible sealing member defined in said closure conduit;
3. A post defined on the outer surface of said closure; and
C. A demountable pouring spout further comprising
1. At least one conduit adapted to frictionally engage said closure conduit;

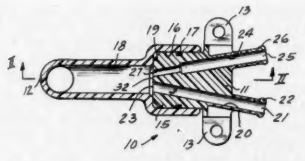


2. A piercing device formed at one end of said spout conduit; and
3. At least one orifice defined in said spout conduit adjacent said piercing device, said orifice being adapted to frictionally engage said closure post.

3,884,388
MIXING DEVICE FOR A BEVERAGE DISPENSER

Donald E. Holcomb, Brooklyn Center, Minn., assignor to The Cornelius Company, Golden Valley, Minn.

Filed Apr. 26, 1973, Ser. No. 354,689
Int. Cl. B67d 5/60
U.S. Cl. 222—132 6 Claims

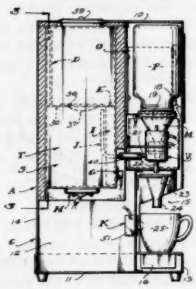


1. A mixing device for beverage dispenser, comprising:
a. a body having a beverage concentrate passage with an inlet for pressure concentrate, and a water passage with an inlet for pressurized water, said passages having spaced outlets, the axes of said passages converging at a point beyond said outlets; and
b. a separate spout detachably secured to said body, said spout having a mixing portion in which said point is located, the axis of the mixing portion being horizontal, and a discharge portion of circular cross-section extending transversely to the axis of the mixing portion, the axis of said water passage being substantially tangent to said circular cross-section for swirling the mixture about the axis of said discharge portion, the cross-sectional flow area of said spout being at all points larger than the combined flow areas of said passage outlets.

3,884,389
WATER SUPPLY FOR VENDING MACHINES

Ernest Newell Martin, Escondido, Calif., assignor to Arrowhead Puritas Water, Inc., Los Angeles, Calif.

Filed June 28, 1974, Ser. No. 484,241
Int. Cl. B67d *5/62*
U.S. Cl. 222—146 HE **10 Claims**

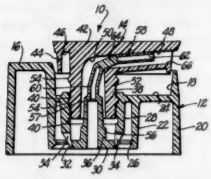


1. A water supply means for a beverage dispensing machine comprising an elongate vertical tank, a partition within the tank defining upper and lower chambers, a water inlet opening in the top of the tank, a flow beaning aperture in the partition communicating with the chambers, a vent pipe communicating with the top of the lower chamber and with atmosphere above the high water level in the upper chamber, water dispensing means to intermittently dispense a predetermined volume of water comprising an elongate vertical open ended stand pipe, the volumetric extent of which is substantially equal to the volume of water to be dispensed and arranged with its upper end in close proximity to the bottom surface of the partition and communicating with the lower chamber and a normally closed valve with inlet means connected with the lower end of the stand pipe and outlet means to dispense water in the stand pipe, the rate of flow through the aperture being less than the rate of flow through the valve when the valve is open.

3,884,390
PUSH-PULL CLOSURE WITH PROBE TO PREVENT CLOGGING

Robert E. Hazard, North Kingston, R.I., assignor to Polytop Corporation, Slatersville, R.I.

Filed Nov. 2, 1973, Ser. No. 412,157
Int. Cl. B65d *47/28*
U.S. Cl. 222—149 **3 Claims**



1. A dispensing closure having a closure base and a spout member, said closure base being adapted to be attached to a container and having passage means extending therethrough, said spout member having a discharge passage extending therethrough and being mounted on said base so as to be movable between an opened position in which said spout member is spaced from said passage means and in which said discharge passage is in communication with said passage means and a closed position in which said spout member acts as a valve member and fits against said base adjacent said passage means so as to close off said passage means from said discharge passage in which the improvement comprises:

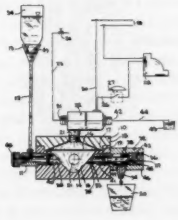
one portion of said discharge passage being at an angle to another portion of said discharge passage,

an elongated, flexible probe means located on said base so as to extend into said discharge passage in said spout member for displacing material from within the interior of said discharge passage when said spout member is moved from said open position to said closed position, said probe means being sufficiently long so as to extend nearly through said discharge passage in said spout member when said spout member is in said closed position, and being sufficiently flexible so as to bend intermediate its ends to accommodate changes in position of said spout member and said discharge passage relative to said closure base said spout member terminating in an end remote from said passage means, said end fitting against a portion of said closure base when said spout member is in said closed position.

3,884,391
AUTOMATIC BAR

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Filed May 9, 1973, Ser. No. 358,532
Int. Cl. B67d *5/10*
U.S. Cl. 222—129.4 **4 Claims**



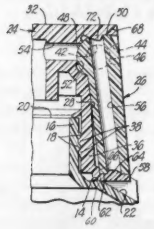
1. In a system for automatic dispensing of liquid from a supply to a receiver means in precise volumetric displacement upon each actuation, a metering pump for displacing exact amounts of liquid per stroke when actuated by pressurized fluid, a liquid supply means including means for automatic level control of liquid supplied, a pressurized fluid supply means for pump actuation, a fluid network including lines and valves for control of liquid supply from said supply means to receiver means, a fluid conduit means including controls interconnecting said liquid supply means with said pump, said fluid network further including lines and valves for supply and control of said pressurized fluid supply means, a computerized counter means including a network of electric leads interconnecting said counter with said controls in said fluid network including electric switching means, means for initiating system operation by said counter including means for accounting and inventorization means and means for totalling, including means for controllably supplying liquid from said supply means to said receiver means via said metering pump, said pump including a conically shaped pumping chamber for housing liquid prior to displacement from the pump and a conically shaped actuating chamber for pressurized fluid supply, said chambers separated by a stretchable membrane of elastic material mounted in a flat plane therebetween and retained therein by a pilot cap having a control valve incorporated therein and interconnected with the pressurized fluid supply source in said fluid network and also interconnected electrically with said counter within said network of electric leads, said pumping chamber further including at least a pair of radial ports for liquid inlet at one end provided with control valve also interconnected within said fluid network with fluid

supply means by said fluid conduit and said counter electrically through said leads while at the other end liquid discharge port provided with a check valve including a nozzle allowing liquid displacement from the pumping chamber when actuating chamber receives said pressurized fluid to expand said membrane from said original flat plane to a final stretched position closely conforming to said conical shape of said pump chamber providing liquid displacement of precise volumetric quantity upon each stroke produced by said pressurized fluid entering said actuating chamber, including means for electrical energization of controls and operation of said counter to report totals.

3,884,392
CHILD-RESISTANT CLOSURE

Robert E. Hazard, North Kingstown, R.I., assignor to Polytop Corporation, Slatersville, R.I.

Filed Nov. 17, 1972, Ser. No. 307,516
Int. Cl. B67d *5/32*
U.S. Cl. 222—153 **17 Claims**



1. A dispensing closure having a cap and a spout, said cap including a skirt for attaching said closure to a container and an opening leading through said cap, said spout being rotatably mounted on said cap and having a passage extending therethrough, said spout being capable of being rotated by direct manual engagement between a closed position in which said opening is sealed off by contact with said spout and an open position in which said passage is in alignment with said opening in which the improvement comprises:

latch means of a resilient material formed integrally with said cap

said latch means including a flat tab covering an end of said spout when said spout is in said closed position, said tab extending from said cap and fitting against said end of said spout to close off said end when said spout is in said closed position, said tab being separate from said skirt,

said latch means also including a holding means extending from said tab which is engaged by said spout when said spout is moved from said open position to said closed position, such movement causing temporary deflection of said latch means until such time as said spout is in said closed position,

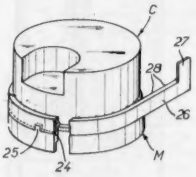
said tab being sufficiently resilient so as to engage said spout so that said holding means hold said spout against movement when said spout has been moved to said closed position,

said tab being exposed to the exterior of said spout so as to be capable of being physically engaged and pushed generally away from said spout when said spout is in said closed position so as to release said spout so that it can be rotated to said open position.

3,884,393
ROTATABLE CONTAINER CLOSURE INCLUDING A REMOVABLE LOCKING ELEMENT

Victor Wassilieff, 84, Rue de l'Assomption, 75016 Paris, France

Filed Dec. 29, 1972, Ser. No. 319,661
Claims priority, application France, Dec. 30, 1971, 71.47469
Int. Cl. B67b *5/00*
U.S. Cl. 222—153 **18 Claims**

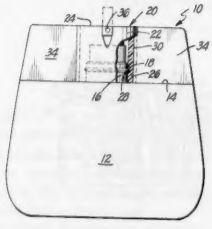


1. A container closure combination comprising an assembly of a cap component and a container component disposed in coaxial relationship, interengaging means on said components for controlling the axial movement of said cap component relative to said container component towards a dispensing position in accordance with the relative angular positions of said components, said interengaging means including axial projection and recess means alignable in one of said relative angular positions for preventing said relative axial movement and alignable in another of said relative angular positions for facilitating said relative axial movement, said combination including guiding means arranged on said components guiding said components during axial assembly of said components into said one angular position, and stopping means arranged on said components for stopping the cap from rotating from said one angular position to said another of said relative angular positions, said stopping means including a tearable element with the tearing of said element enabling the cap component to rotate from said one angular position to said another angular position.

3,884,394
CONTAINER AND CONTAINER CLOSURE COMBINED STRUCTURE

Robert E. Hazard, North Kingston, R.I., assignor to Polytop Corporation, Slatersville, R.I.

Filed Dec. 19, 1973, Ser. No. 426,302
Int. Cl. B67d *5/32*
U.S. Cl. 222—153 **7 Claims**



1. The combination of a container having an extending, hollow neck and a container closure having a cap and a closure member at least one of which is formed of a material capable of temporary deformation, said cap including a dependent skirt located concentrically with said neck, said cap having an opening extending therethrough, said closure member being a spout and being mounted on said cap so as to be capable of being moved between opened and closed positions,

said opening being closed off when said closure member is in said closed position, and being opened when said closure member is in said open position, said neck and said skirt including interengaging mounting means securing said neck to said skirt against linear movement along said neck away from said container, said mounting means permitting said closure to be assembled on said neck through temporary internal deformation and to be rotated on said neck, in which the improvement comprises:

cooperating interlocking means on said cap and said container which fit within one another as said cap is moved in the direction of the vertical axis of said neck for preventing any rotary movement of said skirt relative to said neck,

said interlocking means serving to maintain said cap in one orientation with respect to said container so that said spout will be located on said cap in one orientation with respect to said container.

3,884,395

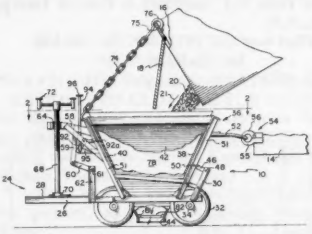
ASPHALT SPREADER

George R. Keenan, Saginaw, Mich., assignor to R. E. Corporation, Saginaw, Mich.

Filed Mar. 14, 1974, Ser. No. 451,220

Int. Cl. A01c *15/00*

U.S. Cl. 222—176 **8 Claims**



1. Apparatus for use in laying a strip of flowable material alongside a road or the like, said apparatus comprising a frame; ground engaging means supporting said frame for movement; an open top hopper carried by said frame for receiving and discharging said material, said hopper comprising confronting, downwardly converging front and rear walls and confronting, downwardly converging end walls, said front and rear walls and said end walls terminating short of convergence to form an opening at the bottom of said hopper through which said material may be discharged; a movable wall member having downwardly tapering sides corresponding to the convergence of said front and rear walls so as to be interposed between said end walls with its lower edge at the bottom of said hopper and with said sides in engagement with the front and rear walls; and means carried by said hopper for supporting the lower edge of said movable wall at any selected one of a number of positions between said end walls, whereby the size of said opening may be varied according to the position of the lower end of said movable wall.

3,884,396

CARTRIDGE TYPE DISPENSER WITH RESILIENT SLITTED OUTLET VALVE

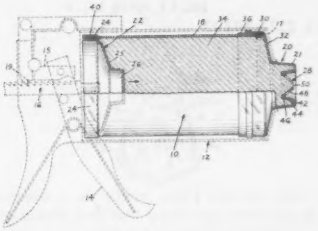
Robert L. Gordon; Keith A. Cooper, both of Monroe, and John C. Siegele, New City, all of N.Y., assignors to International Paper Company, New York, N.Y.

Filed July 29, 1974, Ser. No. 492,472

Int. Cl. G01f *11/00*

U.S. Cl. 222—327 **20 Claims**

1. In a cartridge-type dispensing package comprising a hollow cylindrical container for holding a supply of semisolid extrudable contents, said body being closed at one end by a dispensing head and closed at the other end by a plug adapted to serve as a piston within said body for cooperation with a dispensing gun to extrude increments of the contents of said package through said dispensing head when said dispensing gun is actuated to apply pressure through said plug upon said contents, the improvement which comprises a self-adjusting velocity-limiting extrusion nozzle in said dispensing head, said extrusion nozzle comprising a cone made of flexible and resilient material, said cone having a circular orifice portion lying in a plane transverse the axis of said cone and truncating said cone near the apex thereof, and a plurality of slots formed in said cone and extending in converging relation from points near the base of said cone into said circular orifice portion, the



material of said cone lying between said slots comprising a plurality of flexible resilient fingers which taper in width from base portions near the base of said cone and terminate in tips arranged around and thus defining said circular orifice portion, said circular orifice portion and said slots together constituting a star-shaped orifice having a predetermined total area when no pressure is applied to said contents by actuation of said dispensing gun, and said fingers when said contents are extruded through said nozzle by application of varying amounts of pressure upon said contents by said dispensing gun yielding with progressively increasing resistance from tips to base portions thereof to flare apart and increase the area of said star-shaped orifice in proportion to said varying amounts of pressure applied to said contents.

3,884,397

APPARATUS FOR FEEDING MATERIAL TO A GAS GENERATOR

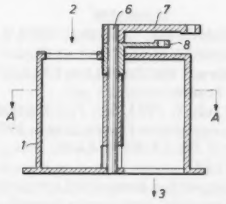
Karl Erik Gustav Andersson, Motala, Sweden, assignor to AB Motala Verkstad, Motala, Sweden

Filed June 5, 1973, Ser. No. 367,097

Claims priority, application Sweden, June 15, 1972, 7914/72

Int. Cl. G01f *11/10*

U.S. Cl. 222—370 **1 Claim**



1. Apparatus for feeding material to a gas generator comprising a cell feeder for preventing passage of gas through said apparatus, said cell feeder including a cylindrical housing having upper and lower end walls, an inlet opening formed in said upper end wall and an outlet opening formed in said lower

end wall, means for compressing material received within said housing including two segment means independently movable in said housing and adapted to close said openings, each of said segment means being shaped in the form of a cylinder sector and rotatably mounted about a common shaft, and means for driving each of said segment means whereby material received within said housing will be compressed prior to unblocking of said outlet opening thereby preventing the backflow of gas therethrough from the gas generator.

3,884,398

ACTUATION OVERCAP FOR AEROSOL CAN

James Hugh McLaughlin, Ridgefield, N.J., assignor to Center For New Product Development, New York, N.Y.

Filed Jan. 10, 1973, Ser. No. 322,559
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.13 **1 Claim**

1. A combination dispenser and axially displaceable closure cap for use with a pressurized can having a valve item, said cap comprising:

a. a generally flat, transverse end wall having a dispensing arrangement including a tubular boss integral with and extending inwardly of said end wall and a plug member secured in said boss, said plug member including a nozzle having a discharge orifice, a first bore that defines a transverse interface for engaging the valve stem of the pressurized can and a second bore for receiving said nozzle whereby said discharge orifice and said first bore are in fluid communication with each other;

b. a peripheral skirt integral with and extending downwardly from said end wall about said boss; and

c. finger tip receiving means formed integrally with the exterior surface of said cap whereby when an axially directed cap displacing force is applied to said finger tip receiving means by the user's finger tips the contents of the can will be discharged into the user's palm upon initial axial movement of said cap and when the axially directed force is removed said cap will automatically return to a non-dispensing portion.

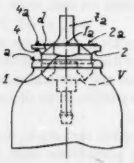
3,884,399

ATTACHMENT FOR VARYING SPRAY FROM PRESSURIZED CONTAINERS

Jean-Jacques Matern, Villa Henri-Leon Chemin Tanit, 06160 Juan Les Pins, France

Filed July 5, 1973, Ser. No. 376,908
Claims priority, application France, July 6, 1972, 72.25774
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.13 **3 Claims**

1. In combination with a pressurized container of material that is discharged from the container by laterally tilting a valve that is disposed axially of the container, a disc carried by the container coaxially with an annular rim on the container, said disc being in the form of an attachment separable from a discharge conduit of the container and having an integral coaxial tube that fits over said discharge conduit of the container, the disc having a discharge conduit coaxial with the disc for the selective discharge of material therethrough from the interior of the container, and means mounting the disc on the discharge conduit of the container for tilting movement of the disc with said valve, the disc having on its underside confronting and spaced from said rim a plurality of portions that



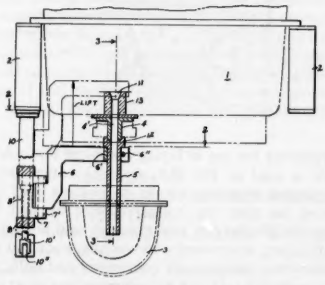
are spaced different distances from the rim measured in a direction parallel to the axis of the container when the valve is closed and the disc is coaxial with the rim, whereby the tilting of different said portions into contact with said rim tilts said valve varying amounts to regulate the nature and quantity of the discharge from the container.

3,884,400

ARTICULATED HOLDER FOR POURING TUBE

George Tuschak, Rego Park, N.Y., and Karl L. Backhaus, West New York, N.J., assignors to Concast Incorporated, New York, N.Y.

Filed Sept. 25, 1973, Ser. No. 400,686
Int. Cl. B22d *37/00*
U.S. Cl. 222—533 **3 Claims**



1. In a continuous casting machine comprising a pouring vessel having an outlet passage in the bottom thereof and a receiving vessel, in combination, a tubular device, means for mounting said tubular device for universal movement in all directions in a horizontal plane, comprising a holder arm having said tubular device mounted on one end thereof, a link having one end pivotally connected to the other end of said arm, and means including a vertical guide column and a lifting slide pivotally connected to the other end of said link and mounted on said guide column for raising and lowering said tubular device with respect to said pouring vessel to bring said tubular device and said outlet passage into register.

3,884,401

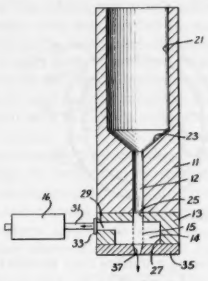
VALVE

Ernest Orval Winkler, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed June 22, 1973, Ser. No. 372,675
Int. Cl. B65g *53/40*
U.S. Cl. 222—544 **4 Claims**

3. A method for controlling the downward flow of particulate material in a fluid medium through a generally vertical flow passage, comprising, diverting the flow of fluid through

said passage at a point intermediate its ends through a porous wall having a porosity such that the fluid can pass therethrough but the particulate material therein can not, said flow diversion being of sufficient magnitude as to suspend the particulate material in the passage at the porous wall to form



a bridge across said passage, thereby blocking further flow of particulate material through the passage, and wherein the size of said passage is sufficiently large such that the blocked particles are subsequently released by gravitational force when the diversion of fluid flow through the porous wall is stopped.

3,884,402

APPARATUS FOR FOLDING SHIRTS OR SIMILAR ARTICLES OF CLOTHING FOR PACKING

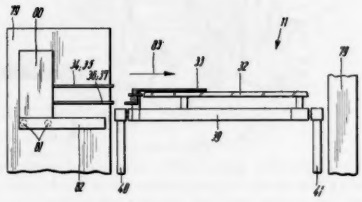
Heinrich Knappe, Eidinghausen; Karl-Heinz Nolte, Vlotho Weser, and Reinhold Kempelmann, Bad Salzuflen, all of Germany, assignors to Herbert Kannegiesser Kommanditgesellschaft, Vlotho Weser, Germany

Filed May 20, 1974, Ser. No. 471,612

Claims priority, application Germany, May 22, 1973, 2325887

Int. Cl. A41h *33/00*

U.S. Cl. 223—37 **5 Claims**



1. An apparatus for folding shirts or similar articles of clothing for packing, wherein a plurality of folding devices (11) receive a shirt or similar article of clothing and are adapted to move to a plurality of folding stations, the apparatus having means for the mechanical folding of shirts or similar articles of clothing comprising:

a. a first folding means (34–37) for folding the shirt or similar article of clothing in a direction parallel to its lengthwise axis;

b. means (80–82) to move said first folding means from a starting position away from said folding devices (11) to an operating position adjacent to said folding device (11) and return to said starting position;

c. a second folding means (51, 52, 55, and 57) for folding the shirt or similar article of clothing in a direction transverse to its lengthwise axis after said shirt has been folded in the lengthwise direction; and

d. means (84–86) to move said second folding means from a starting position away from said folding device (11) to an operating position adjacent to said folding devices (11) and return to said starting position.

3,884,403

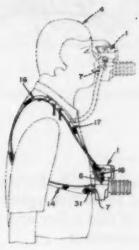
ARTICLE CARRYING STRAP

Robert A. Brewer, 15 Castle Park Way, Oakland, Calif. 94611

Filed Dec. 7, 1973, Ser. No. 422,734

Int. Cl. A45f *5/00*

U.S. Cl. 224—5 V **7 Claims**



1. In combination, an article, and a carrying strap means adapted to releasably hold said article against the chest of the wearer in a carrying position and permitting selective eye level positioning in an operating position comprising:

a. said article having an apertured coupling element thereon;

b. releasable strap engaging means consisting of the loop portion of a hook and loop fastener mounted on a substantial lateral rear surface portion of said article at a lower position than said coupling element;

c. said strap consisting of a single flexible nonelastic elongated member consisting of the following portions and having a length adapted to span the distance from the wearer's chest (first chest portion), over one shoulder (first shoulder portion), under the arm (first under arm portion), across the chest (transverse chest portion), under the second arm (second under arm portion), over the second shoulder (second shoulder portion), and back to the chest (second chest portion);

d. a releasable coupling member attached to a first end of said strap and dimensioned to releasably couple to said apertured coupling element on said article;

e. connecting means attaching said second end of said strap to said article; and

f. fastener means having the hook portion of a hook and loop fastener mounted on a substantial lateral portion of said mid portion of said strap for registered releasable engagement with said releasable strap engaging loops mounted on said article thereby positively restraning side to side, forward, and vertical movement of said article.

3,884,404

VEHICLE FOR CARRIER AND LOADING DEVICE

Granger H. Frost, Box 892, Nantucket, Mass. 02554

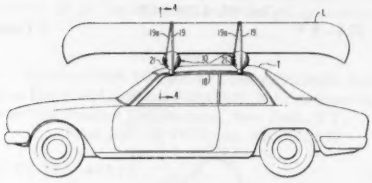
Filed Mar. 15, 1974, Ser. No. 451,596

Int. Cl. B60r *9/04*

U.S. Cl. 224—42.1 B **5 Claims**

1. A device for loading and carrying an article on a vehicle having rain gutters along opposite sides thereof, comprising: at least one elongated, hollow, elastic roller filled with a flowable material; a flexible net contactingly surrounding said roller; a hook member secured to opposite ends of said roller for engagement with the rain gutters; said net being attached to said hook members; tie-down lines secured to said hook members and being engaged with a portion of said net as said lines extend over the article supported on said roller; the spacing between the gutters being greater than the spacing between said hook members thereby effecting a tight engage-

ment of the gutters by said hook members as said roller is stretched lengthwise into place; and wherein any rolling movement of said roller effects an increase in tension of said lines



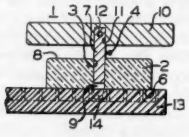
as they roll up on said roller to thereby secure the article more tightly in place, and to further tighten the engagement of the gutters and hooks as said roller and net are stretched in the direction of such movement.

3,884,405

TOOL FOR NOTCHING THE EDGE OF FRANGIBLE SHEET MATERIAL

Paul E. Olson, Lexington, Ky., assignor to American Standard Incorporated, New York, N.Y.

Filed Mar. 12, 1973, Ser. No. 340,389
Int. Cl. B26f *3/00*
U.S. Cl. 225—102 **4 Claims**



1. A partition removal tool for removing partitions in a fluid circuit plate having moulded therein a plurality of chambers, each separated from each one of a plurality of surrounding adjacent chambers by a partition, said partitions being selectively removable to form passageways extending through said chambers, said partition removal tool comprising:

a. a stem having a slot of a chosen length extending inward from one end thereof and of sufficient width for receiving therein a selected partition separating a pair of adjacent chambers in the fluid circuit plate, wherein the improvement comprises:

b. a transparent member, one end of which constitutes a plane forming a right angle with the axis of said stem, disposed about said stem and so fixedly secured thereto at such a location intermediate the ends thereof that when a partition selected by viewing through said transparent member and separating a pair of adjacent chambers in the fluid circuit plate is disposed in said slot, said one end of said member abuts a plurality of other partitions in said circuit plate disposed in surrounding relation to said selected partition, and

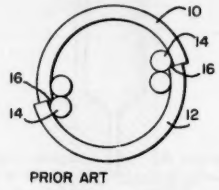
c. a handle secured to the opposite end of said stem whereby a torque applied to said handle, while any selected partition is disposed in said slot, is effective via said stem to sever said partition from the circuit plate.

3,884,406

FRACTURED BEARING RACE

Willard L. Bowen, Harwinton, Conn., assignor to The Torrington Company, Torrington, Conn.

Division of Ser. No. 260,838, June 8, 1972, Pat. No. 3,834,722.
This application Feb. 14, 1974, Ser. No. 442,481
Int. Cl. B26f *3/00*
U.S. Cl. 225—103 **9 Claims**



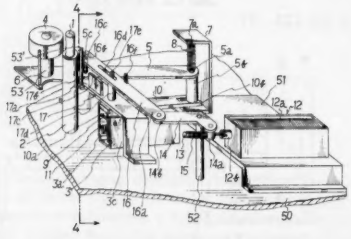
1. A system for fracturing a unitary race member comprising: means for holding and supporting the race member; and a plurality of individually adjustable pressure applying means adapted to apply forces at a plurality of spaced apart longitudinal points on the outer surface of the race member whereby the outer surface of the race member may be initially stressed at at least one longitudinal point and thereafter fractured along a predetermined longitudinal direction.

3,884,407

PINCH ROLLER SHIFTING MECHANISM FOR SEQUENTIALLY SHIFTING A PINCH ROLLER IN TWO SUBSTANTIALLY PERPENDICULAR DIRECTIONS TOWARD A CAPSTAN

Masayuki Sugimizu, Kanagawa, Japan, assignor to Denki Onkyo Company, Limited, Tokyo, Japan

Filed Sept. 11, 1973, Ser. No. 396,333
Int. Cl. G03b *1/56*; G11b *15/24*; B65h *17/20*
U.S. Cl. 226—90 **7 Claims**



1. A pinch roller shifting mechanism for tape recorder or tape player comprising:

a. a capstan for forwarding a magnetic tape,

b. a pinch roller rotatably mounted on a shaft parallel to the axis of said capstan,

c. support means for supporting said pinch roller and for moving said pinch roller in the axial direction of said capstan and for moving said pinch roller in another direction perpendicular to said axial direction to move said pinch roller toward and away from said capstan,

d. a first driving means comprising a first solenoid plunger having a first plunger rod which moves in its axial direction when said first solenoid plunger is energized,

e. first coupling means connecting said first plunger to said support means for moving said support means in the axial direction of said capstan wherein said pinch roller is moved to a position in the same horizontal plane as said capstan in response to the movment of said first plunger rod,

f. a second driving means comprising a second solenoid plunger having a second plunger rod which moves in its axial direction when said second solenoid plunger is energized,

g. second coupling means connecting said second plunger to said support means for moving said support means from a position where said pinch roller opposes said capstan to a position where said pinch roller contacts said capstan whereby said pinch roller contacts said capstan in response to the movement of said second plunger rod, and

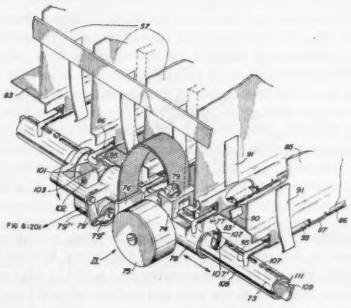
h. a unitary guide means comprising a vertical wall means in contact with said support means for guiding the movement of said support means in the axial direction of said capstan until said pinch roller rises to a position opposing said capstan and a horizontal surface means in contact with said support means when it is in its raised position for guiding the horizontal movement of said support means and maintaining the vertical alignment of said pinch roller with said capstan to guide said pinch roller from a position where said pinch roller opposes said capstan to a position where it contacts said capstan.

3,884,408

APPARATUS FOR EJECTING A STAPLED SET OF SHEETS SIDEWISE FROM THE COLLATING BINS

Larry L. Leiter; Gerard C. Wright, both of Fairport, and David G. Bowman, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 27, 1973, Ser. No. 428,977
Int. Cl. B27f *7/10*
U.S. Cl. 227—100 **2 Claims**



1. In a reproduction system including apparatus for reproducing copy sheets and a collating apparatus having a plurality of bins into which the reproduced copy sheets are collated according to a copy program under control of the system logic, means for ejecting completed sets of sheets from the collator bins comprising:

an elongated rail disposed alongside the collator bins;

carriage means adapted for longitudinal movement along said rail and rotary movement about said rail;

a freely rotatable driven wheel mounted on said carriage;

a drive wheel mounted on said carriage opposite said driven wheel, said drive wheel being movable toward said driven wheel;

means for sequentially moving said carriage longitudinally along said rail to successively locate said carriage opposite each bin of said collator;

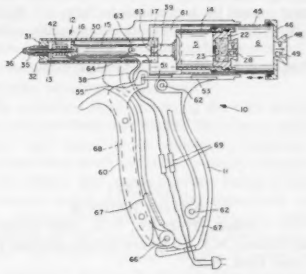
means for rotating said carriage about said rail toward the collator bins to position said driven wheel and said drive wheel on opposite sides of a collated set of copies in each bin, movement of said drive wheel towards said drive wheel causing each set of copies to be pinched therebetween and ejected sideways out of the bin.

3,884,409

HAND OPERATED DESOLDERING DEVICE

Harry Kaufman, 5709 White Hickory Cir., New Rochelle, N.Y. 33319

Filed Nov. 8, 1973, Ser. No. 413,905
Int. Cl. B23k *3/00*
U.S. Cl. 228—20 **16 Claims**



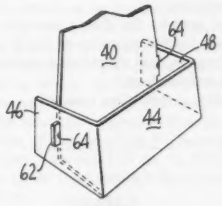
1. A desoldering device comprising a hollow nozzle, means for heating the nozzle, means for establishing reduced pressure at the nozzle and comprising a first chamber and a second chamber, means under operator control for selectively enlarging and reducing the volume of the second chamber, and means for preventing increased air-pressure within the first chamber when the second chamber volume is reduced and comprising first one-way air-flow means pneumatically coupling the first and second chambers so as in an open position to allow air-flow from the first to the second chambers and in a closed position to prevent air-flow from the second to the first chambers, and means for actuating the first one-way air-flow means to the open position upon actuation of the second chamber volume enlarging means.

3,884,410

ANGLE-IN LITERATURE HOLDER

Albert S. Giesecke, 400 Montgomery St., San Francisco, Calif. 94104

Filed May 18, 1973, Ser. No. 361,790
Int. Cl. B65d *5/18*
U.S. Cl. 229—16 D **1 Claim**



1. A literature holder or the like having a back member and a box member at the bottom front thereof, said literature holder being foldable from a single sheet of stiff stock, wherein said sheet comprises the following parts:

a. a flat back member,

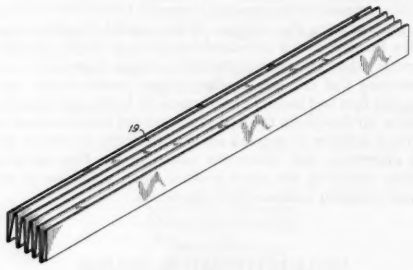
b. a base member extending from adjacent the bottom of said back member, said base member being connected by a foldline to said back member,

c. a front member extending from said base member and being connected to said base member by a foldline,

d. tabs extending rearwardly from each edge of said front member and being connected thereto by means of a foldline,

e. each of said tabs having a perforation at about the center of said tabs,
f. said back member having outstanding side tabs near the bottom thereof, said tabs being of a size to be insertable in said perforations,
g. the width of said front member and said back member being substantially the same,
h. whereby said base member can be folded upwardly with respect to said back member to form a bottom member, said front member can be folded upwardly with respect to said bottom member, and said tabs can be inserted in said perforations to form a boxlike structure.

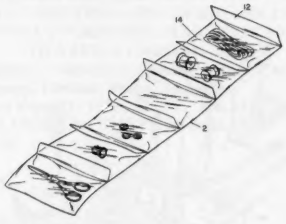
3,884,411
CARTON HANDLE
Richard W. Carlson, Warwick, N.Y., and Glenn A. Nesty, Convent Station, N.J., assignors to International Paper Company, New York, N.Y.
Filed June 14, 1973, Ser. No. 369,854
Int. Cl. B65d *5/74, 5/46, 25/22*
U.S. Cl. 229—17 G **4 Claims**



1. In combination with a disposable container having a carrying handle secured thereto, the improvement wherein said handle comprises:
a. a sheet of initially flat fabric material which has been folded upon itself a plurality of times to form a narrow rectangular strip, said sheet being useful as a wiping cloth when it is unfolded; and
b. a plastic film surrounding said strip.

3,884,412
CLEAR VIEW THREAD OR YARN HOLDER
Nellie Peck Price, 10185 W. 25th Ave., No. 29, Denver, Colo. 80215
Filed Apr. 2, 1973, Ser. No. 346,750
Int. Cl. B65d *27/10*
U.S. Cl. 229—69 **1 Claim**

1. A device for the storage of a multitude of small separate items comprising, in combination:
a flat elongated rectangularly shaped base strip of flexible material having a flat top surface, a flat bottom surface, opposed parallel side edges, a bottom end, and a top end;
a bottom member of a flat flexible configuration having a width equal in width to said base strip and having a top edge, a bottom edge, opposed parallel side edges, a top surface, and a bottom surface;
said bottom member disposed in overlying juxtaposition with said top surface of said base strip member adjacent said bottom edge thereof with said bottom member side edges and bottom edge overlying said base strip side edges and bottom edge and with said bottom member top edge disposed inwardly of said base strip bottom end;
means affixing said side edges and bottom edge of said bottom member to said side edges and bottom end of said base strip member to define a pocket therebetween having ingress and egress by way of said bottom member top edge;
a top member of an identical size and configuration to said bottom member and having a top edge, a bottom edge, opposed side edges, a flat top surface, and a flat bottom surface;
said top member bottom surface disposed in overlying juxtaposition with said base strip top surface extending transversely across said base strip and spaced slightly downwardly from said base strip top end;
means affixing said top member side edges to said base strip side edges and affixing said top member bottom edge to said base strip to form therewith a pocket having ingress and egress by way of said top member top edge;
said top end portion of said base strip projecting beyond said top member top edge being folded upwardly and over onto itself to define a flap for covering in an overlying manner said top edge of said top member for closing said compartment therein;
a flap formed integrally with said bottom edge of said top member and projecting outwardly therefrom completely between the side edges thereof;

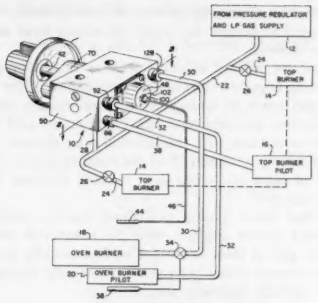


a plurality of intermediate pocket forming members disposed in tandem relationship completely between said bottom edge of said top member and said top edge of said bottom member along said top surface of said base strip, each of said intermediate members consisting of a flat rectangularly shaped configuration having a flat top surface, a flat bottom surface, opposed side edges, a top edge, a bottom edge, and a flap formed integrally with said bottom edge and projecting outwardly therefrom extending the full width of said intermediate member;
said side edges and said bottom edge of each of said intermediate members affixed to said side edges of said base strip and said top surface of said base strip in a manner to define a plurality of independent pockets disposed completely along said base strip between said top and bottom members thereof with ingress and egress of each pocket being by way of said top edge of said intermediate member;
said flap portion of each of said intermediate members overlying said top edge of said lower adjacentmost intermediate member to provide a cover for said pocket and prevent inadvertent opening of the pocket for inadvertent discharge of the contents and items from the pocket;
said base strip, said bottom member, said top member, and said intermediate members each being manufactured of the same flexible type material such that the device may be rolled into a cylindrical coiled configuration from end to end for storage and carrying in a compact and convenient manner.

3,884,413
OVEN CONTROL

Frank H. Berquist, Clarendon Hills, Ill., assignor to Harper-Wyman Company, Hinsdale, Ill.

Filed Mar. 14, 1974, Ser. No. 451,216
Int. Cl. F23n *3/06*
U.S. Cl. 236—15 A **15 Claims**

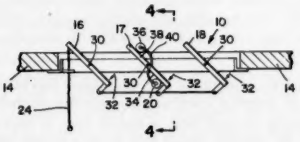


1. A control valve for use with a gas range having a plurality of pilot burners for igniting main burners, said valve comprising a valve body having an inlet for gas and a plurality of outlets for supplying gas to said pilot burners, a manually operable valve member carried by said valve body for selectively controlling the flow of gas between said inlet and said outlets, said valve including passage means controlled by the position of said valve member relative to said body for selective communication between said inlet and said outlets when said valve member is moved between first, second and third positions, said passage means aligned to communicate between said inlet and said plurality of outlets in said first position, aligned to communicate between said inlet and less than all of said outlets in said second position and aligned to provide no communication between said inlet and said plurality of outlets in said third position, and a thermostatic valve means controlled by the position of said valve member relative to said body for maintaining a selected temperature range at the main burner of one of said pilot burners when said valve member is positioned within a range of automatic temperature controlling positions, said passage means aligned to communicate between said inlet and said outlets and a main outlet for supplying gas for one of said main burners in said temperature controlling range.

3,884,414
SOLAR HEATING DEVICE

Stephen C. Baer, Corrales, N. Mex., assignor to Zomeworks Corporation, Albuquerque, N. Mex.

Filed Apr. 8, 1974, Ser. No. 458,913
Int. Cl. F24f *7/02*
U.S. Cl. 236—49 **8 Claims**



1. Apparatus for maximizing the transfer of solar energy to the interior of a structure and minimizing heat loss therefrom, said apparatus comprising:

a louver panel forming a portion of the exterior of the structure, said louver panel being pivotable in a first direction about an axis substantially passing through the center of gravity of said panel to open the panel;

interior reservoir means fixed to the interior surface of the panel on one side of the pivotal axis of said panel, the weight of said interior reservoir means adapted to bias the panel in said first direction to open the panel;

exterior reservoir means fixed to the exterior surface of the panel on the other side of the pivotal axis of said panel, the weight of said exterior reservoir means adapted to bias the panel in a second opposite direction to close the panel;

a tube providing fluid communication between the interior and exterior reservoir means; and

a partially vaporized fluid occupying the tube and the interior and exterior reservoir means, the relative proportions of liquid and vapor in the respective reservoir means being dependent upon the relative vapor pressure in said reservoir means, said vapor pressure being a function of the internal temperature of the associated reservoir means, a higher temperature on the exterior of the structure relative to the temperature on the interior of the structure or direct exposure of the exterior reservoir means to the sun raising the relative vapor pressure in the exterior reservoir means to force liquid through the tube to the interior reservoir means causing the panel to open to allow transfer of solar energy to the interior of the structure, a higher relative vapor pressure in the interior reservoir means resulting in liquid being forced through the tube to the exterior reservoir means to close the panel and minimize heat loss from the structure.

8. A method for maximizing the transfer of solar energy to the interior of a structure and minimizing heat loss therefrom, said method comprising the steps of:

providing at least one pivotable louver panel forming a portion of the exterior of the structure;

providing interior and exterior reservoir means on the interior and exterior surfaces of the panel respectively, said interior and exterior reservoir means being on opposite sides of the pivotal axis of said panel so that the weight of the interior reservoir means biases the panel in one direction to open said panel, and the weight of the exterior reservoir means biases the panel in a second opposite direction to close said panel;

providing fluid communication between the interior and exterior reservoir means;

providing a partially vaporized fluid occupying the tube and the interior and exterior reservoir means;

opening the louver panel when the temperature on the exterior of the structure is greater than the temperature of the interior of the structure or when the exterior reservoir means is exposed to the sun by heating the exterior reservoir means to force a part of the liquid portion of the fluid through the tube to the interior reservoir means; and

closing the louver panel when the temperature on the interior of the structure is greater than the temperature on the exterior of the structure by heating the interior reservoir means with ambient air to force part of the liquid portion of the fluid through the tube to the exterior reservoir means.

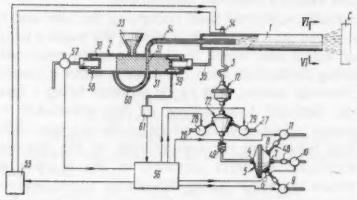
3,884,415
INSTALLATION FOR EXPLOSIVE DEPOSITION OF INORGANIC COATINGS

Anatoly Ivanovich Zverev, ulitsa Bratislavskaya, 26, kv. 22; Mikhail Antonovich Pudzinsky, ulitsa Sverdlova, 13, kv. 21; Viktor Ivanovich Shesternenkov, ulitsa Semashko, 21, kv. 123, and Mikhail Pvalovich Dudnik, ulitsa Serova, 30/1, kv. 7, all of Kiev, U.S.S.R.

Filed July 3, 1974, Ser. No. 485,453
Claims priority, application U.S.S.R., July 9, 1973, 1932402
Int. Cl. B05b *1/24*
U.S. Cl. 239—79 **5 Claims**

1. An installation for explosive deposition of inorganic coatings, comprising: a tubular-shaped combustion chamber

closed at one end; a proportioner for batchwise feeding a powdered coating material into said combustion chamber; a mixing chamber having inlet sleeves and an outlet sleeve; a safety coiler; said mixing chamber communicated through its inlet sleeves with the sources of the components of an explosive mix and of an inactive gas and through its outlet sleeve and said safety coiler, with said combustion chamber so as to feed said mix thereinto, where the latter is made to explode and thus set up a detonation wave which ejects the coating material through the open end of said chamber onto the surface of the workpiece under treatment; a device for extinguishing the backfire resulting from blowbacks from said combustion chamber into said safety coiler, said device being located between said coiler and the outlet sleeve of said mixing chamber; a hollow housing of said device; a partition made of a porous refractory material and adapted to divide the interior space of said housing of said device into two chambers one of which communicates with said safety coiler and the other, with the outlet sleeve of said mixing chamber.



3,884,416

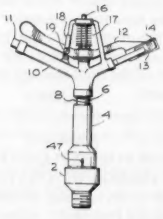
DEVICE FOR DISTRIBUTING IRRIGATION WATER

Michael L. King, Hollywood, Calif., assignor to Paul D. Norton, Alhambra, Calif., a part interest

Filed Aug. 29, 1974, Ser. No. 501,639

Int. Cl. B05b *3/02*

U.S. Cl. 239—97 **6 Claims**



1. A device for distributing irrigation water, comprising:

a body;

a hollow, tubular shaft, rotatably disposed in a vertical bearing passing through said body, and provided with a basal surface orthogonal to the rotational axis thereof;

seal means between said body and said shaft;

a sprinkler head affixed to the upper end of said shaft;

a primary orifice piercing said sprinkler head, in communication with the hollow bore of said shaft and substantially radially aligned with said rotational axis;

a secondary orifice piercing said sprinkler head opposite said primary orifice, in communication with said hollow bore;

vane means, resiliently pivoted in said sprinkler head and adapted to deflect the water jet issuing from said secondary orifice;

stop means, affixed in said sprinkler head, for adjustably limiting angular travel of said vane means under influence of said water jet issuing from the secondary orifice;

port means, piercing said basal surface of said shaft and communicating with the internal bore thereof, including a circular port centered on the rotational axis of the shaft and at least one other port radially disposed from said circular port;

an orifice plate, facing said basal surface, pierced by a central orifice aligned with the rotational axis of said shaft, and at least one other orifice radially spaced from said central orifice, adapted for periodic alignment with said radially disposed port;

spring means, urging said orifice plate into sliding contact with said basal surface; and

key means, for preventing rotational displacement of said orifice plate with respect to said body.

3,884,417

NOZZLES FOR THE INJECTION OF LIQUID FUEL INTO GASEOUS MEDIA

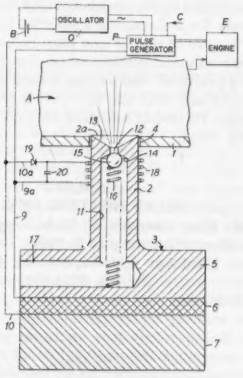
Bernard Raymond Sheffield, Upminster, and Mark Wallinger Goodinge, Hutton, both of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Jan. 30, 1973, Ser. No. 327,905

Claims priority, application United Kingdom, Feb. 1, 1972, 4609/72

Int. Cl. F02m *27/08*

U.S. Cl. 239—102 **8 Claims**



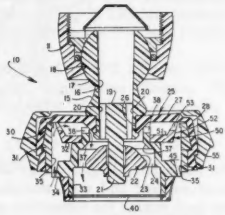
1. An arrangement for injecting liquid fuel into combustion air for an internal combustion engine comprising: a nozzle body having an end face, a nozzle inlet in said body, a fuel passage for feeding liquid fuel to said nozzle inlet, a nozzle outlet in said end face, vibrator means which when energized apply ultrasonic vibrations to said nozzle body, energization control means for said vibrator means responsive to engine operating data to energize said vibrator means during engine operation to produce periods of vibration varying in duration according to the momentary fuel requirement of the engine, and a normally closed valve in said fuel passage which valve

is open only when said ultrasonic vibrations are applied to said nozzle body thereby to atomize fuel from said end face.

3,884,418
AERATING AND SPRAYING ATTACHMENT FOR FAUCETS

Richard L. Ritzenthaler, Crystal Lake, Ill., and Thomas J. Wilcox, East Troy, Wis., assignors to Cranda Corp., Alden, Ill.

Filed Aug. 30, 1974, Ser. No. 502,153
Int. Cl. E03c *1/08*
U.S. Cl. 239—428.5 **4 Claims**



1. An aerating and spraying attachment for faucets operable at high water pressures without objectionable spray splash and without requiring excessive force in manually reverting from spraying position to aerating position and operable at low water pressures to maintain spraying position, comprising:

a faucet-attachable stem member having a longitudinal opening for the flow of water;

a splash plate on the end of said stem member for receiving water flow;

a resilient casing member on said stem member above said splash plate, said casing member having a diaphragm portion and a peripheral skirt portion;

an annular spray body member having a peripheral wall secured to said peripheral skirt portion, said spray body member having spray apertures, a central tubular portion for an aerated water stream and an inner wall for sealing with said splash plate;

said resilient casing member and said spray body member enclosing an annular chamber communicating with said spray apertures; and

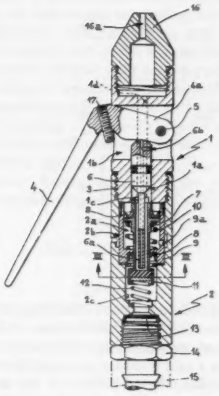
a restrictive cup on said spray body member, said restrictive cup having a peripheral wall normally engaging said diaphragm portion and dividing said annular chamber into upper and lower chamber portions, said restrictive cup having flow openings of comparatively small total size leading from said upper chamber portion to said lower chamber portion;

said diaphragm portion deformable for spraying position to establish sealing engagement between said splash plate and said inner wall of said body member and water flow into said upper chamber portion and thence to said lower chamber portion and said spray apertures, said flow openings in said restrictive cup providing proper effective back pressures at low line pressures to maintain said diaphragm portion in deformed condition, high line pressures causing said diaphragm portion to separate from said peripheral wall of said restrictive cup, thus increasing the flow area and maintaining the effective back pressures substantially constant so as to permit manual reversion to aerating position without difficulty, the effective area of said spray apertures such as to deliver splashless spray at high line pressures.

3,884,419
BLOW GUNS

Jean-Pierre Geoffray, 42, Rue Jeanne d'Arc, Lyon, France

Filed July 17, 1973, Ser. No. 380,120
Claims priority, application France, July 19, 1972, 72.26781
Int. Cl. B05b *7/02, 1/30*
U.S. Cl. 239—526 **3 Claims**



1. A blow gun for delivering a jet of compressed air from an air inlet through a nozzle, comprising:

a body supporting said nozzle at its front end and having at its rear end said compressed air inlet, and the body having a central portion including a first chamber communicating at its forward end through channel means with said nozzle, and the body further including a second chamber behind the first chamber and communicating with said air inlet, the chambers being axially aligned and joined by a passage;

a hollow piston member axially slidable in sealing engagement in the first chamber and extending through said passage into said second chamber, the piston having an opening therethrough and having a rearwardly facing valve seat in the opening;

a valve overlying the rearwardly facing seat;

spring means yieldably urging the valve against the seat;

a calibrated spring in the first chamber and yieldably urging said piston forwardly therein toward the nozzle;

a push rod in the opening of the hollow piston and operative when displaced rearwardly to raise the valve off of the seat; and

manually operated means carried by the body and operative when actuated to displace the push rod rearwardly to displace the valve, whereby air under pressure passes through the hollow piston into the first chamber forward of the piston and displaces the piston rearwardly to modulate the valve opening when the force of the air pressure on the piston exceeds the force of the calibrated spring, thereby to regulate the pressure of the air delivered to the nozzle.

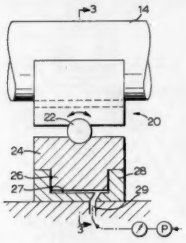
3,884,420
TRUNNION BEARING SUPPORT SYSTEM

Lucian Kops, Montreal, Quebec, Canada, assignor to Dominion Engineering Works Limited, Quebec, Canada

Filed Dec. 3, 1973, Ser. No. 421,227
Int. Cl. B02c *17/18;* **F16c** *17/16*
U.S. Cl. 241—176 **3 Claims**

1. A grinding mill having a drum mounted for rotation about a horizontal axis supported for rotation on a pair of end trunnions, each trunnion having trunnion support means including

a bearing shoe to receive the respective trunnion for rotation therein, a housing to support said shoe, housing pivot bar means having the axis thereof extending horizontally, in a direction transversely of the mill in relation to the trunnion main axis to permit pivoting of said housing with a single degree of freedom about said horizontal axis, and support pad means beneath said pivot means rotatably mounted in a circular recess having the axis thereof extending substantially vertically to permit oscillation of said housing with a single degree of freedom about a substantially vertical axis, whereby eccentricities between a said trunnion and said drum are accommodated by and limited to oscillation of the trunnion about a horizontal axis substantially at right angle to the trunnions and about a vertically extending axis.



3,884,421

ROLLERMILLS

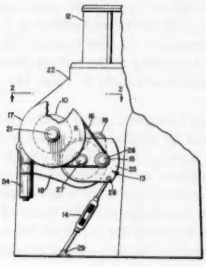
Richard Fullalove, Manchester, and Frederick Spencer, Stockport, both of England, assignors to Henry Simon Limited, Stockport, Cheshire, England

Continuation-in-part of Ser. No. 219,454, Jan. 20, 1972, abandoned. This application Feb. 8, 1974, Ser. No. 440,865

Claims priority, application United Kingdom, Mar. 2, 1971, 5800/71

Int. Cl. B02c *4/32*

U.S. Cl. 241—230 **14 Claims**



1. A rollermill having a pair of grinding rolls, one of which is driven at a required relatively high speed, and means for driving the other roll from said one high speed roll at a predetermined lower speed, characterized by means providing a desired ratio of speeds between said rolls comprising a reduction gear-box having an input shaft connected through an endless drive transmitting member to be driven from said high speed roll at a speed higher than that of said high speed roll and an output shaft driven at said lower speed connected to drive said lower speed roll at said lower speed.

3,884,422

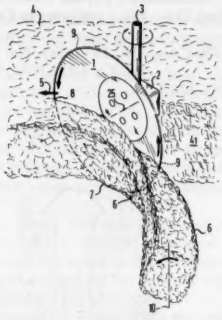
DEVICE FOR CUTTING LEAF AND STALK MATERIAL

Ernst Weichel, Postfach 30, 7326 Heiningen, Germany

Continuation of Ser. No. 202,614, Jan. 13, 1972, abandoned. This application Aug. 23, 1973, Ser. No. 391,024

Int. Cl. B02c *18/06*; **B26d** *3/28*

U.S. Cl. 241—279 **27 Claims**



1. A device for cutting an elongated rope-like portion from a mass of agricultural leaf and stalk material comprising a rotatable cutting tool, means for supporting and moving the mass of material along a path of travel, means for supporting and positioning said tool relative to the path of travel of the mass of material, means for rotating said tool about an axis, said means for supporting and positioning said tool relative to the mass of material being arranged to form an acute angle between the direction of movement of the mass of material and the axis of rotation of said tool, said cutting tool having an endless curvilinear cutting edge symmetrically arranged about the axis of rotation of and being located on the radially outer edge of said cutting tool and located in a flat plane, said cutting tool having a surface located radially inwardly from said cutting edge and extending angularly to the plane containing said cutting edge so that said surface trails said cutting edge as its moves into the mass of material and said cutting edge defines a curvilinear arc between its point of contact with and its point of exit from the mass of material.

3,884,423

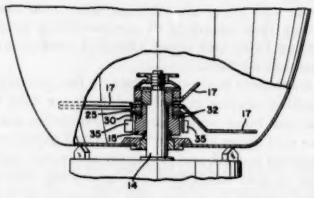
IMPELLER FOR FOOD PREPARING MACHINE

Jackie N. Wilson, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Mar. 26, 1973, Ser. No. 344,854

Int. Cl. B02c *18/12*

U.S. Cl. 241—282.1 **3 Claims**



1. In an apparatus for comminuting and mixing materials, including a container having a bottom wall surrounded by a side wall, a rotatable drive shaft passing through the bottom wall, a blade structure having at least one blade drivably mounted on the drive shaft for processing material within the container, a motor drivably connected to the rotatable shaft for rotation thereof, and non-bladed impeller means separated from the blade structure and drivably mounted on the shaft

between the bottom of the container and the blade structure for rotation with the shaft to impel material adjacent thereto away from the drive shaft, said impeller means comprising:

a. a drive disc mounted on the shaft for rotative driving therefrom,

b. a plurality of arms depending from said disc, and

c. impeller portions depending from said arms near the plane of rotation of the lowest blade of the blade structure for impelling material away from the drive shaft into the path of the blade structure to be processed along with the main body of the material within the container.

3,884,424

METHOD AND APPARATUS FOR WINDING VERTICAL CORES

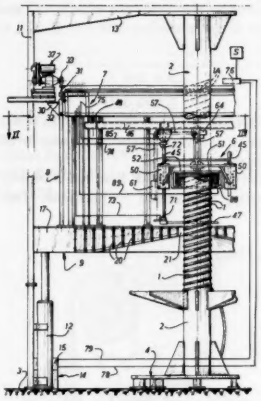
Maurice Bosquain, Paris; Marcel Bourjot, La Varenne Saint Maur, and Maurice Kirsch, Champigny-sur-Marne, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes George Claude, Paris, France

Filed July 27, 1972, Ser. No. 275,746

Claims priority, application France, Nov. 13, 1969, 69.38976; July 9, 1970, 70.23899; Australia, Mar. 14, 1972, 39969/72

Int. Cl. B21f *3/04, 17/00;* **B65h** *57/28*

U.S. Cl. 242—7.02 **14 Claims**



1. An installation for winding elongated material such as sections of tube about a vertical core, comprising:

a vertical core,

a substantially horizontal and annular platform having a central opening of adjustable dimension, surrounding said vertical core with at least a first layer of said sectional material wound thereon,

at least one winding device carried on said annular platform, comprising a support, means mounting said support for rotation around said central opening, a frame, means mounting said frame on said support for vertical movement with respect thereto, means rotatably supporting a spool of said sectional material on said frame,

first power means for imparting a rotary movement to said support with respect to said annular platform,

control means associated with said winding device, for controlling the vertical movement of said frame together with said spool of sectional material, according to a contour of said vertical core, said control means comprising:

a feeler device mounted on said frame of the winding device, comprising sensing means for detecting the level of said frame in relation to said contour and for delivering a signal translating any deviation in the level of said frame with respect to the level of said contour,

second power means for imparting a vertical movement to said frame together with said spool or said sectional material, with respect to said support, acting in response to said signal to compensate for said deviation in the level of said frame, said sensing means of the feeler device comprising:

feeling means comprising a finger adapted to engage said contour, a supporting arm on which said finger is secured, a pivot horizontally mounted in said feeler device, on which said supporting arm is perpendicularly secured, said supporting arm being pivotally movable about said pivot, a potentiometer comprising an arm integral with said supporting arm, said potentiometer emitting a voltage-differential signal and translating any deviation in the level of the frame of said winding device with respect to the reference level of said contour and a amplifier for said voltage-differential signal,

said second power means comprising an electrical motor supplied with a current resulting from said voltage-differential signal.

3,884,425

APPARATUS FOR USE IN WINDING PNEUMATICALLY ADVANCED YARNS

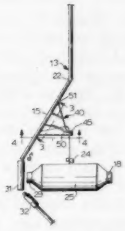
Rolland Sartori, Roanne, France, assignor to Rhone-Poulenc-Textile, Paris, France

Filed Apr. 17, 1974, Ser. No. 461,756

Claims priority, application France, May 11, 1973, 73.17435

Int. Cl. B65h *54/02*

U.S. Cl. 242—18 R **8 Claims**



1. In an apparatus for advancing yarn from an upstream station to a support around which the yarn is wound:

a tube for entraining the yarn in an expanding stream of fluid, said tube having a first portion and a second portion, said second portion being bent to form an angle with respect to said first portion and having a slot therein through which the yarn is extracted from the second portion when the yarn is wound on the support;

reciprocating guide means for distributing the yarn on the support as the guide means reciprocates, said guide means reciprocating the yarn in a plane as the yarn is accumulated;

means for cutting the yarn upstream of the second portion of the tube when the support is almost full; and

means disposed between the end of the first portion of the tube and the reciprocating guide for holding the yarn in the guide after the yarn has been cut.

3,884,426
WINDING AND CHANGEOVER DEVICE

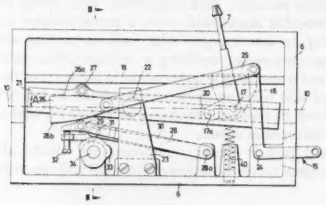
Peter Hermanns, Stommeln near Cologne, Germany, assignor to FMN Schuster & Co., Hurth-Efferen, Germany

Filed Oct. 6, 1972, Ser. No. 295,636

Claims priority, application Germany, Oct. 8, 1971, 2150301; Jan. 13, 1972, 2201448

Int. Cl. B65h *54/32, 54/38*

U.S. Cl. 242—43.1 **22 Claims**



1. An apparatus for winding thread onto a spool to form a thread package comprising:

a. a single reverse-thread roller secured in a casing to a rotatable shaft means,

b. a single thread guide mechanism including a thread guide element mounted for back and forth movement by means of the reverse-thread roller,

c. means for varying the stroke of the thread guide element in response to a variation in the diameter of the yarn package being produced on said spool,

d. said stroke varying means including a pivotally mounted guide rail having a guide slot disposed therealong and a cam mechanism for changing the pivotal position of the guide rail,

e. said thread guide including a slide piece disposed in the guide rail slot to change the path of travel for said slide piece,

f. control means for controlling the overall stroke length of the thread guide element in a predetermined manner to dispose the thread on the thread package at the edge thereof in a predetermined pattern,

g. said control means including a control cam means rotated in response to the rotation of said shaft means,

h. said cam mechanism including a first cam surface working with a first cam follower effective to change the pivotal movement of the guide rail in response to an increase in the diameter of said package being wound and a second cam surface and

i. an adjustment device disposed between said second cam surface and said control cam means for actuating the second cam surface to adjust the overall stroke length of the thread guide.

3,884,427
APPARATUS FOR REWINDING SLITTED FILM STRIPS IN A ROLL SLITTING AND REWINDING MACHINE

Kenzo Hashimoto, and Kimihiro Wada, both of Kyoto, Japan, assignors to Nishimura Seisakusho Co., Ltd., Koyoto, Japan

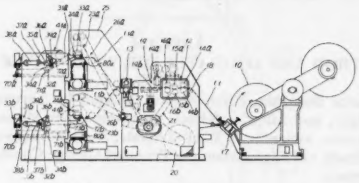
Filed Sept. 20, 1973, Ser. No. 398,924

Claims priority, application Japan, Sept. 22, 1972, 47-110869

Int. Cl. B65h *35/02, 17/00*

U.S. Cl. 242—56.2 **2 Claims**

1. Apparatus for rewinding slitted film strips in a roll slitting and rewinding machine comprising means for slitting a continuous film to a plurality of strips, a plurality of rewinding cores for rewinding said plurality of strips, respectively, means for driving said cores for rotation, a plurality of endless belt assemblies engagable with said rewinding cores, respectively, to initiate the rewinding of said slitted film strips onto the respective rewinding cores, each of said endless belt assemblies comprising an endless belt stretched between a plurality of pulleys and means for moving each of said endless belt assemblies between a first position in which said endless belt is engaged with its own cooperating rewinding core, said endless belt being pressed at a stretched portion thereof against said



cooperating core along its peripheral direction so that said endless belt is moved along with said rewinding core for initiating the rewinding of said slitted film strips onto said rewinding core, and, a second position in which said endless belt is kept apart from its cooperating core.

3,884,428
SPINDLE GUIDE FOR A DRAWTWISTING TUBE

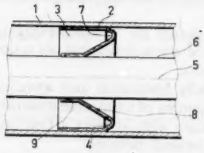
Albert Gretener, Zug, Switzerland, assignor to Gretener AG, Cham, Switzerland

Filed Jan. 17, 1973, Ser. No. 324,353

Claims priority, application Switzerland, Jan. 18, 1972, 684/72

Int. Cl. B65h *75/10*

U.S. Cl. 242—118.3 **3 Claims**

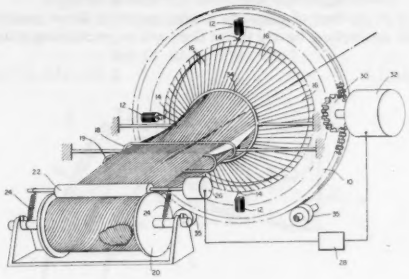


1. A spindle guide of stamped sheet metal for a drawtwisting tube having a cylindrical tube guide portion, an annular ring portion defining a flat annular surface extending perpendicular to and radially inwardly of said tube guide portion at one end thereof for contacting a flat surface of an inserting pin and a funnel portion extending from said ring portion inwardly of said tube guide portion and toward the other end of said tube guide portion, said funnel portion having a smoothly curved portion connected with a radially internal end of said ring portion defining a recess, whereby the forces imposed on the spindle guide during insertion into a tube will be absored by said ring portion and said curved portion.

3,884,429
WARP BEAM FOR TRIAXIAL WEAVING

Norris F. Dow, Radnor, Pa., assignor to N. F. Doweave, Inc., Philadelphia, Pa.

Filed Sept. 10, 1973, Ser. No. 395,529
Int. Cl. B65h *55/00*
U.S. Cl. 242—159 6 Claims

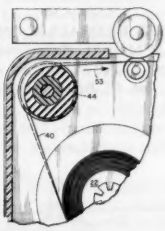


1. A warp beam for triaxial weaving consisting of a plurality of yarn courses forming a flattened sleeve wrapped spirally upon itself, said yarn courses being disposed in paths generally parallel to one another and helical with respect to the longitudinal axis of said sleeve.

3,884,430
TAPE CASSETTE

Peter G. Martin, Arlington, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Dec. 20, 1972, Ser. No. 317,100
Int. Cl. B65h *17/20*; G03b *1/04*; G11b *15/32*
U.S. Cl. 242—199 4 Claims



1. A magnetic tape cassette comprising:

a substantially enclosed generally rectangular housing having an open portion along one side thereof;

first and second tape storage reels disposed in said housing for rotation about respective parallel axes thereof;

means associated with at least one of said storage reels and adapted to be coupled to drive means external of said housing and operative to provide rotary motion of the reel serving as a take-up reel;

a supply of magnetic recording tape carried by said storage reels;

means supported by said housing for disposing the portion of said tape between said reels for motion in a predetermined travel path within said housing and along the open portion thereof;

said tape being driven at the open portion of said housing by a capstan drive assembly external of said housing and cooperative with said tape, and a portion of said tape along the open portion of said housing being arranged for operative association with a magnetic head;

said tape disposing means including at least one compressible elastic roller disposed at a fixed position within said housing at a corner portion thereof and along said travel path between said capstan drive assembly and said storage reel from which tape is drawn, said at least one compressible elastic roller always engaging said tape and over which said tape extends in said travel path;

said at least one roller being bidirectionally rotatable and operative to rotate about its axis at said fixed position as said tape moves through said path, and being elastically compressible in response to a predetermined tensile stress in said tape caused by rapid tape acceleration, said elastic compression being operative to reduce the length of said tape travel path between said capstan drive assembly and said storage reel from which tape is drawn by an amount sufficient to at least partially compensate for the effects of tensile stress in said tape caused by acceleration forces;

said at least one roller including:

a cylindrical hub of rigid material supported for rotation about its axis by said housing;

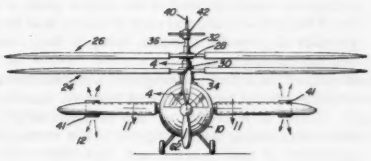
a pair of peripheral circular flanges on said hub and rotatable with said hub in fixed radial relationship therewith and defining an annular channel around said hub and between said flanges; and

a ring of compressive elastic material disposed around said hub within said channel and operative for rotation with said hub and elastically compressible in relation to said fixed flanges and hub.

3,884,431
CONVERTIBLE AIRCRAFT HAVING OPPOSITELY ROTATING ROTORS

Charles E. Burrell, 27 S. Sixth St., Shamokin, Pa. 17872

Filed Jan. 14, 1974, Ser. No. 433,063
Int. Cl. B64C *27/24*
U.S. Cl. 244—7 A 3 Claims



1. A convertible aircraft comprising:

a fuselage;

a wing movably mounted to the fuselage for permitting variations of the angle of incidence of the wing;

at least two rotors mounted in vertically spaced relation for rotating in opposite directions to achieve helicopter operation of the aircraft;

source means for powering the aircraft;

means connected between the fuselage and the rotors for supporting the rotors;

drive train means connected between the power source means and the supporting means for selectively rotating the rotors;

an auxiliary wing assembly having horizontal and vertical components, the assembly being mounted on the supporting means for decreasing the rate of descent of the aircraft during a power interruption;

selective means connected to the drive train means for positioning the rotors in alignment with the wing during normal flight of the aircraft, the selective means comprising:

a wheel fixedly mounted to a shaft portion of the drive train;

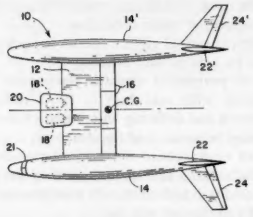
means for rotating the wheel to a preselected position corresponding to alignment of the rotors;

a projection extending from the wheel;
first means manually actuated for engaging the projection; and
second means manually actuated for engaging a slot in the wheel.

3,884,432
HIGH-LIFT AIRCRAFT

Willard S. Blanchard, Jr., and Joseph L. Johnson, Jr., both of Hampton, Va., assignors to National Aeronautics and Space Administration Office of General Counsel, Washington, D.C.

Filed June 5, 1973, Ser. No. 367,268
Int. Cl. B64c *15/02*; **B64d** *27/00*
U.S. Cl. 244—15 **6 Claims**



1. A high-lift aircraft having a center-of-gravity comprising:
a wing provided with flaps having a centroid-of-lift;
a plurality of fuselages;
said wing carried by and mounted on the tips thereof by two of said plurality of fuselages;
said centroid-of-lift of said flaps being located substantially at the center-of-gravity of said high-lift aircraft;
a plurality of propulsion means carried by said wing;
at least two of said plurality of propulsion means grouped in a common nacelle located in the vertical plane of symmetry of the said aircraft, and each of said at least two of said plurality of propulsion means being in fluid connection with an exhaust duct,
said exhaust ducts being arranged in a stacked overlapping relationship and located in said common nacelle,
each of said at least two of said plurality of propulsion means exhausting high-energy air in the vertical plane of symmetry of said aircraft such that when any of said propulsion means is inoperative, yawing moments in said aircraft are minimized,
a pair of horizontal tails fixed one each onto the outboard surfaces of the two of said plurality of fuselages mounted at the tips of said wing;
whereby, during high-lift flight said horizontal tails are in an upwash field and contribute a positive increment to trim lift;
nose-down pitching moments generated by said flaps are reduced as said flaps act substantially through said center-of-gravity of said aircraft; and,
said plurality of fuselages serve to shield the noise radiated from said plurality of propulsion means.

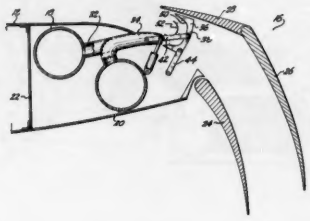
3,884,433
WING MOUNTED THRUST REVERSER

John D. Alexander, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 11, 1973, Ser. No. 405,385
Int. Cl. B64c *21/04*
U.S. Cl. 244—42 CC **8 Claims**

1. A wing mounted thrust reverser for an airplane having a thrust augmentation system comprising:
a. a flap having upper and lower segments which in extended position for take-off or landing provide a channel therebetween,
b. means for rearwardly directing into the channel a spanwise volume of gas under pressure from plenum chambers through wing mounted nozzles,
c. means for turning the rearwardly directed gas for smooth flow within the channel between the flap segments, and
d. means for moving the turning means into the channel to redirect the gas flow forward to spoil the wing lift characteristics and provide a reversing thrust.

7. A method of effecting a wing mounted thrust reverser with an airplane having thrust flaps and augmentation system

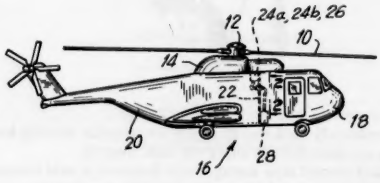


with the steps comprising: utilizing segmented above and below augmentation flaps, directing a stream of gas through plenum chambers and nozzles on each wing into space between the segmented flap, positioning a member with a Coanda surface immediately ahead of the flaps to turn the flow of gas efficiently into the flaps, holding the member in position with a pair of pivotable links extending between the member and the wing structure, and rotating the links to move the back side of the member between the segments and directly into the stream of gas to redirect said gas forward to effect thrust reversal.

3,884,434
HELICOPTER HYDRAULIC OIL SYSTEM

Richard P. Nichols, 5 Main St., Tarrytown, N.Y. 10591

Filed Apr. 22, 1974, Ser. No. 463,051
Int. Cl. B64d *33/00*
U.S. Cl. 244—53 R **9 Claims**



1. A helicopter including hydraulic oil feeding apparatus for attachment to mounting means and for replenishing hydraulic oil containers permanently connected to hydraulic points of said helicopter, said apparatus comprising a supply tank, a single pair of supply conduits connected to said tank and leading to said means, quick disconnect joints at said means for facilitating connection and disconnection of said supply conduits, service and return conduits leading from each of said containers to said joints for establishing flow with said single pair of supply conduits, said single pair of supply conduits being arranged for selective connection of one of said containers to said supply tank.

3,884,435

METHOD FOR THE CONTROL OF A JET AIRCRAFT AND APPARATUS FOR PERFORMING THE METHOD

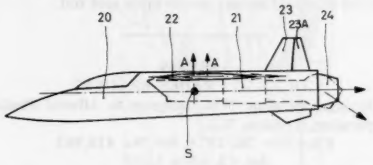
William J. Croy, Vaterstetten, and Andreas Mederer, Marktschwaben, both of Germany, assignors to Messenschmitt-Bolkow-Blohm GmbH, Munich, Germany

Continuation of Ser. No. 88,737, Nov. 12, 1970. This application Feb. 15, 1973, Ser. No. 332,698

Claims priority, application Germany, Dec. 22, 1969, 1964205

Int. Cl. B64c *3/38, 15/02*

U.S. Cl. 244—76 J **5 Claims**



1. A method for maintaining a stabilized flight of an aircraft having propulsion means for propelling a gaseous jet rearwardly of said aircraft for propulsion of said aircraft, a wing with ailerons for aerodynamic support and a vertical tail surface, said aircraft being free of a horizontal tail surface, the steps comprising:

selectively controlling a movable nozzle adjacent the aft end of said aircraft to deflect said gaseous jet to thereby define a primary control for controlling the direction of flight of said aircraft;

selectively controlling trim apparatus mounted forwardly of said aft end to trim the flight of said aircraft independently of said primary control, said vertical tail surface and said ailerons on said wing; and

producing a difference in the time it takes for the movable nozzle to cause a maximum deflection of said gaseous jet and the, time it takes the trim apparatus to reach full trim effectiveness, the time for said trim apparatus to reach full trim effectiveness being greater than the time for the primary control to cause a maximum deflection of the gaseous jet so that said primary control will be able to return quickly to a position providing maximum thrust for said aircraft after said aircraft has been trimmed.

2. An apparatus for maintaining a stabilized flight of an aircraft, comprising:

propulsion means for propelling a gaseous jet rearwardly of said aircraft from a nozzle rearwardly mounted on said aircraft to discharge said gaseous jet along a flow-axis for propulsion of said aircraft;

a wing having ailerons for aerodynamic support and a controllable vertical tail surface, said aircraft being free of a horizontal tail surface;

a movable nozzle rotatably secured to said aircraft aft of said first mentioned nozzle and being selectively operative for deflecting said gaseous jet between a first position wherein said flow axis of said jet is directed along and substantially parallel to the longitudinal axis of the aircraft and a second position wherein said flow-axis of said jet is directed at an angle to said longitudinal axis of said aircraft to thereby define a primary control for controlling the direction of flight of said aircraft and to artificially stabilize said aircraft;

attitude control means mounted forwardly of the aft end of said aircraft for trimming the flight of said aircraft by controlling the attitude of said aircraft independent of the aircraft controls offered by said movable nozzle, said vertical tail surface and said ailerons on said wing by generating a movement about the center of gravity of said aircraft, said attitude control means comprising means for supporting said wing for movement forward and rearward of said aircraft to thereby effect an altering of the lift generated by said wing relative to said center of gravity of said aircraft; and

aerodynamic control circuitry for interrelating the movements of said movable nozzle and said attitude control means to thereby achieve an artificial stability in said aircraft.

3,884,436

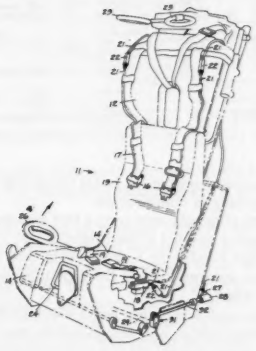
GAS-ACTUATED EMERGENCY PILOT RELEASE SYSTEM

Paul W. Poehlmann, Stinson Beach, Calif., assignor to H. Koch and Sons, Inc.

Filed Nov. 19, 1973, Ser. No. 417,140

Int. Cl. B64d *25/06, 25/10*

U.S. Cl. 244—122 A **18 Claims**



1. In an aircraft equipped with an ejection seat system having an emergency ground egress release mechanism and an ejection escape mechanism, both being adapted to be activated by manual maneuvers of a pilot:

an emergency pilot release system comprising in combination therewith:

a. a plurality of normally closed latching means for connecting a packed parachute canopy and a survival kit to a parachute harness worn by a pilot, said packed parachute canopy and survival kit being releasably secured to said ejection seat system;

b. energizing means mounted on said ejection seat system operatively coupled to said emergency ground egress release mechanism for releasing and opening said latching means, said emergency ground egress release mechanism being adapted to activate said energizing means;

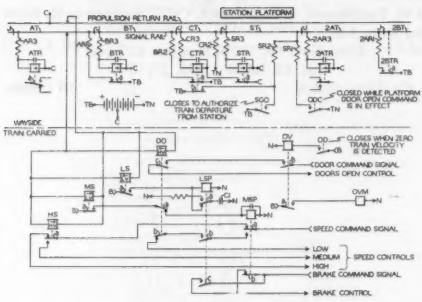
c. fail-safe means operatively coupled to said ejection escape mechanism for disabling said energizing means, the escape mechanism being adapted to activate said fail-safe means;

d. a plurality of connector means, each connecting one of said latching means to said energizing means, said connector means each having connective elements adapted to separate responsive to a tensile stress, whereby said pilot together with said parachute and survival kit connected to his parachute harness will separate from said ejection seat system subsequent to an ejection escape from the aircraft; and

e. means for positively locking said connective elements of said connector means together upon activation of said energizing means, whereby said latching means are positively connected to said energizing means upon

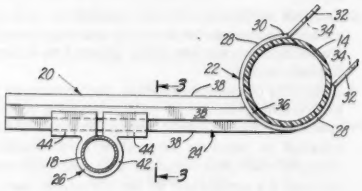
activation of said emergency ground egress release mechanism.

3,884,437
TRAIN CONTROL SYSTEM FOR TRANSIT VEHICLES
William J. Linderman, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.
Filed Oct. 9, 1973, Ser. No. 404,766
Int. Cl. B61l *23/16*
U.S. Cl. 246—63 C **10 Claims**



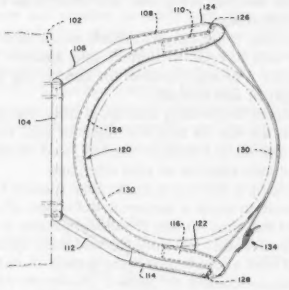
1. A train control system for trains traversing a fixed right-of-way, comprising in combination,
   a. a signaling channel comprising a first and second conductor extending parallel to said right-of-way,
      1. said first conductor being divided into a plurality of separate sections to form corresponding adjacent channel sections,
      2. said second conductor being electrically continuous and connected to a system common bus,
   b. a signal source connected to each first conductor section and to said common bus for transmitting through each channel section a signal having a predetermined distinctive characteristic,
   c. control apparatus on each of said trains coupled across said first and second conductors for receiving the signal transmitted by said source through the section then occupied by that train,
   d. said control apparatus on each of said trains also coupled for controlling selected train functions in response to the distinctive characteristic of the received signal.

3,884,438
PLUMBING STRUCTURE
Duane D. Logsdon, 1719 Canyon Rd., Fullerton, Calif. 92633
Filed Nov. 3, 1972, Ser. No. 303,591
Int. Cl. F16l *3/08*
U.S. Cl. 248—59 **2 Claims**



2. A connecting structure for use in connecting two different pipes which are located in two different parallel planes to one another which comprises:
   a clip means having a base and curved resilient arms extending from said base which are adapted to resiliently engage more than 180° around the exterior of a first pipe in one of said planes,
   a rigid rod having a symmetrical cruciform shape extending from said base of said clip means,
   said clip means and said rod being integrally formed with one another,
   hanger means for engaging a second pipe in the other of said planes, said hanger means being capable of being secured to said rigid rod along the length of said rigid rod so as to hold said second pipe in adjacent to said first pipe,
   said hanger means including means for engaging the exterior of said rod in a plurality of positions around the exterior of said rod and along the length of said rod so as to stabilize said hanger means upon said rod.

3,884,439
GOLF BAG CRADLE-BRACKET
John Jeninga, Delavan, Wis., assignor to Atlantic Products Corporation, Trenton, N.J.
Filed Nov. 26, 1973, Ser. No. 418,983
Int. Cl. A63b *55/08*
U.S. Cl. 248—96 **6 Claims**

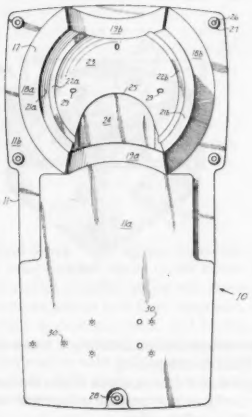


1. A golf bag bracket assembly comprising a support, two laterally spaced support members of circular cross section connected to the support, each of which has a laterally extending side support section for providing side support for a golf bag, said side support sections having an inverted "U" shape with one downwardly extending free end, the side support sections being opposed to and spaced from each other so that the golf bag can be placed between them, said side support section tangentially engaging the bag peripherally at its widest cross section area, downwardly extending and flexible cradling means of thin-walled flexible tubular material disposed between and supported by the side support sections, the cradling means having an unsupported central section which extends downwardly at a sufficient depth to receive substantially half of the peripheral cross section of the golf bag, the cradling means being adapted to engage the periphery of the bag being of sufficient flexibility to provide both a continuous cushioned surface and a movable support which moves with the bag so as to substantially reduce chafing wear at the bag surface in contact with and supported by the cradling means, the cradling means having an inner diameter which is slightly larger than the outer diameter of the support members, the ends of the thin-walled tubular material disposed substantially over the side support section of the corresponding support member.

3,884,440
STRUCTURAL SKID AND PEDESTAL

William N. Rowley, Palos Verdes Estates, and Warand R. Kirish, Arcadia, both of Calif., assignors to Swimquip Division Weil-McLain Company, Inc., El Monte, Calif.

Filed Aug. 6, 1973, Ser. No. 386,053
Int. Cl. A47g *23/02*
U.S. Cl. 248—146 9 Claims

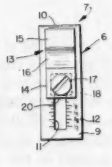


1. A skid for supporting a filter tank and related equipment comprising an integrally formed platform and pedestal, the platform having a flat upper surface and a ribbed under surface, the pedestal being at an end of the platform and comprising an upstanding hollow frusto-conical wall, open at the bottom and having a horizontal base supporting the lower end of said wall, a concave dish-shaped closure supported from the top of said wall, a horizontal ledge at a position intermediate the top and bottom of the wall and extending from a central area of the closure to a position at the exterior of a part of said wall adjacent the platform, a peripheral ledge formed at the top of said wall adapted to support the tank and an indentation extending up said part of said wall adjacent the platform from a position near the bottom of said wall to the top of said wall and meeting said horizontal ledge, to permit access to an underside of an overhang of the tank.

3,884,441
OUTLET BOX MOUNTING DEVICE

Robert L. Barry, 2916 E. Randolph Rd., Silver Spring, Md. 20904

Filed Mar. 22, 1974, Ser. No. 453,995
Int. Cl. H02g *3/08, 3/18, 3/12*
U.S. Cl. 248—205 R 6 Claims

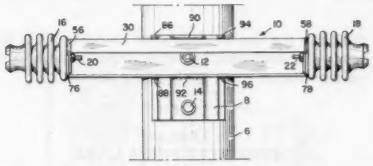


1. A mounting device for an outlet box comprising a spring clip resiliently gripping an outlet box wall at the open end of the box and having a long leg disposed on the outer side of said wall and extending longitudinally thereof, an elongated finger, means securing said finger adjacent one end thereof to the outer side of said clip leg, said finger extending back along the leg from said end and having an opposite end spaced outwardly from said clip leg for engaging the inner side of a wall in an opening of which the box is mounted for cooperation with wall engaging elements of the box which engage the outer side of the wall for securing the box in the wall opening.

3,884,442
TWO POST INSULATOR SUPPORT FOR UTILITY POLES

John E. Breeden, and Robert E. Lane, both of Royston, Ga., assignors to Hopeman Brothers, Inc., New York, N.Y.

Filed Sept. 30, 1974, Ser. No. 510,599
Int. Cl. F16m *13/02*
U.S. Cl. 248—221 5 Claims



1. A two-post insulator support for utility poles comprising an elongated cross-arm formed from a unitary sheet of metal having:

a first elongated rectangular element adapted to be situated with its long dimension extending in the horizontal direction;

a second elongated rectangular element, integral with and perpendicular to the first elongated element, said first and second elements being of nearly equal length and one long edge of the first element being integrally joined with a long edge of the second element so that said elements form an elongated member having an L-shaped cross-section substantially throughout its length;

a first pair of rectangular tabs integral with and perpendicular to the first elongated rectangular element, said tabs extending from the ends of the first elongated rectangular element in the same direction as the second elongated element extends from the first elongated element; and

a second pair of rectangular tabs integral with and perpendicular to the second elongated rectangular element, said tabs of the second pair extending from the ends of the second elongated rectangular element in the same direction as the first elongated element extends from the second elongated element;

the tabs at each end of the cross-arm overlapping each other and having aligned openings for retaining an insulator post.

3,884,443
PEEL-RESISTANT PRESSURE-SENSITIVE HANGERS

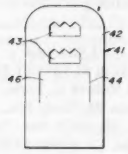
Samuel B. McMaster, Deerfield, Ill., assignor to Do-It Corporation, Wheeling, Ill.

Continuation of Ser. No. 104,420, Jan. 6, 1971, abandoned. This application May 21, 1974, Ser. No. 472,070
Int. Cl. A47g *29/00;* C09j *7/02;* B32b *7/06*
U.S. Cl. 248—467 2 Claims

1. A peel-resistant pressure-sensitive hanger of flexible material having a pressure-sensitive coating arranged on one of its two faces along a longitudinally extending zone extending less than the full height of the hanger, leaving said hanger with a portion bare on both faces by which it may be manipulated; the bare portion of said hanger having a formation for cooperation with a mating member for hanging one by the other for hanging an object from a fixed support;

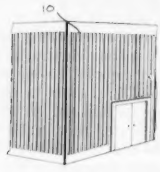
said hanger having slits extending into the coated area from the bare portion to provide a flap including the bare portion and extending out from a point intermediate the height of the coated zone whereby if the flap is sprung

from the plane of the remainder, a tie-down adhesive area will be left behind extending in that plane generally in the



direction the flap extends from its root with a free end relatively unaffected by the springing action to provide peel resistance when applied to a flat surface.

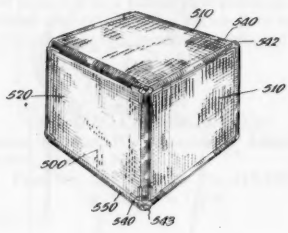
3,884,444
CONCRETE FORM LINER
Stephen S. Dashew, Los Angeles, Calif., assignor to Interform Inc., Compton, Calif.
Division of Ser. No. 206,686, Dec. 10, 1971, Pat. No. 3,780,977. This application Aug. 8, 1973, Ser. No. 386,487
Int. Cl. E04g *11/08*; **B28b** *7/00*
U.S. Cl. 249—112 **3 Claims**



1. A concrete form liner comprising:
a plurality of trough-shaped elements of substantially constant cross-section each having an inner wall and first and second outwardly extending side walls, said first side wall having a flange extending sidewardly away from said second side wall and having a first hook at its end, and said second side wall having a first hook at its end, and said second side wall having a second hook at its outer end extending towards said first side wall so that said elements can be held together with a first hook on one of said elements engaged with the second hook of another of said elements;
each of said trough-shaped elements including a retainer wall (36) with a portion spaced from said second hook of the same element by a distance sufficient to engage and maintain therebetween the first hook on another element.

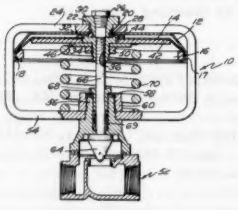
2. A concrete form liner comprising:
a trough-shaped element having an inner wall and first and second outwardly extending side walls, said first side wall having a flange extending sidewardly away from said second side wall and having a first hook at its end, and said second side wall having a second hook at its outer end extending towards said first side wall, said element also having a retainer comprising a wall fixed to said second side wall and lying between the side walls and spaced a predetermined distance from the second hook, so that said element can be held to another similar element with a first hook on one element engaged between the second hook and retainer of the other element.

3,884,445
MACHINE AND METHOD FOR PRODUCING A THREE DIMENSIONAL LATTICE
Homer C. Amos, Palm Springs, Calif., assignor to Brunswick Corporation, Skokie, Ill.
Division of Ser. No. 272,736, July 18, 1972, Pat. No. 3,822,463. This application May 6, 1974, Ser. No. 467,065
Int. Cl. B29c *5/00*
U.S. Cl. 249—205 **5 Claims**



1. A structure for maintaining a three dimensional lattice array of strands comprising:
1 six grid wall surfaces, three of the surfaces substantially of one configuration and the other three surfaces of another specific configuration;
2. means holding the grid surfaces in a hollow shaped configuration; and
3. means for securing a lattice array of strands inbetween the grid wall surfaces.

3,884,446
LOW PROFILE CONTROL VALVE ACTUATOR
Linwood P. Erickson, Warren, R.I., assignor to G. W. Dahl Co., Inc., Bristol, R.I.
Filed Dec. 10, 1973, Ser. No. 423,584
Int. Cl. F16k *31/12*
U.S. Cl. 251—61.4 **3 Claims**

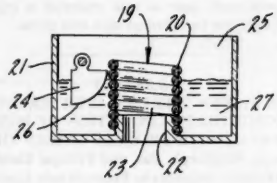


1. A valve actuator comprising a unitary, rigid steel, four-sided tubular frame of generally rectangular cross section, a valve mounted exteriorly on one side of said frame, an actuating rod connected to said valve and extending through said one frame side, said rod being axially movable to open or close said valve, a flexible diaphragm mounted within said frame in a plane substantially normal to the axis of said rod and connected thereto, housing means secured to the inside of said frame cooperating with said diaphragm to define a sealed chamber, means for introducing fluid under pressure into said chamber to flex said diaphragm and hence impart axial movement to said rod, and a coil spring mounted in said frame and normally urging said diaphragm to its non-flexed position.

3,884,447
FLUID VALVE MEANS

Carl J. Alexander, Moore Park, and Robert J. Boudeman, Hickory Corners, both of Mich., assignors to Wells Manufacturing Corporation, Three Rivers, Mich.

Filed June 6, 1973, Ser. No. 367,445
Int. Cl. F16k *15/14, 31/524*
U.S. Cl. 251—144 4 Claims

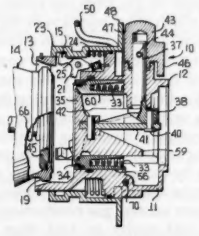


1. A flushing fluid dump valve means comprising
a flushing fluid reservoir having an outlet aperture;
a coil of closely wound metallic spring wire having a plurality of convolutions within said fluid reservoir, defining a fluid passageway in said reservoir, and having one open end thereof secured about said outlet aperture so that the passageway defined by said coil communicates with said outlet aperture through the secured end and with said fluid reservoir through a free open end;
an outer sheath collapsed on said spring wire, made of resilient material having a substantially uniform radial thickness and exerting a radial compressive force along the length of said spring wire; and
flushing fluid dump valve actuating means mounted in said reservior and adapted to deflect said coil;
said coil bearing said outer sheath extending inwardly into said flushing fluid reservoir and providing a flushing fluid retaining portion below the free open end of said coil, and adjacent convolutions of said coil bearing said outer sheath being in fluid-tight relationship relative to each other but permitting the flushing fluid to pass between the convolutions and out through said outlet aperture when said coil is deflected.

3,884,448
COUPLER

James S. Millar, Fountain Valley, and Glenn W. Henderson, Tustin, both of Calif., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Nov. 19, 1973, Ser. No. 417,264
Int. Cl. F16l *37/28*
U.S. Cl. 251—149.9 16 Claims

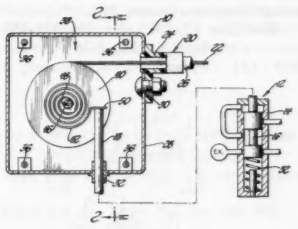


1. A coupler adapted to be connected and disconnected from an adaptor, said coupler comprising a body, a lock pivotally mounted on the body for movement between a latch position and an unlatch position, a sleeve mounted on the body and axially movable between a retracted position and an extended position, means on the sleeve engageable with the lock to hold the latter in its latch position when the sleeve is extended, and a surface on the sleeve facing toward said extended position engageable with a surface on the lock in a manner to hold the lock in its unlatch position when the sleeve is in its retracted position.

3,884,449
TRANSMISSION ASSEMBLY

Paul H. Kehm, Ambler, Pa., assignor to Teleflex Incorporated, North Wales, Pa.

Filed Sept. 4, 1973, Ser. No. 394,358
Int. Cl. F16k *31/44;* B60k *31/00*
U.S. Cl. 251—294 10 Claims

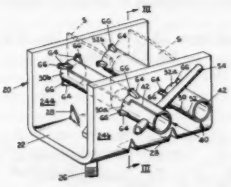


1. A transmission assembly comprising; a modulator valve and a flexible motion transmitting remote control including guide means and a flexible motion transmitting core element movably supported by said guide means, said core element need only to be capable of transmitting tension forces, a flat spring operatively interconnecting said core element and said valve for moving said valve in response to movement of said core element from a neutral position when placed in tension and for returning said core element to said neutral position when the tension forces are removed from said core element.

3,884,450
GROUND ANCHOR FOR MOBILE HOMES AND THE LIKE

Robert C. Brammer, 336 W. Seventh St., Traverse City, Mich. 49684

Filed Jan. 2, 1974, Ser. No. 429,814
Int. Cl. A63b *61/04;* B65d *63/00*
U.S. Cl. 254—164 27 Claims



1. Apparatus for tensioning straps, cables, and the like comprising a support bracket having upstanding flanges, each flange having opposite side surfaces, aligned apertures in said flanges, and means for anchoring said support bracket to the ground; an elongated, resilient, tubular tensioning member extending between said flanges; means for mounting said tensioning member for rotational and axial movement in said apertures for winding a strap, cable or the like thereon and locking the strap, cable, or the like as wound; slot means extending along the side wall of said member for receiving a strap, cable, or the like, said slot means and the resiliency of said tubular member allowing said tubular member to be

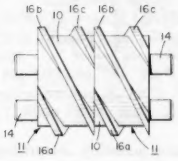
circumferentially compressed; and means for circumferentially compressing said tubular member when said member is moved axially in said apertures including a rounded protrusion at one end of said member for resisting axial movement of said member, said protrusion normally extending into abutment with one of said opposite side surfaces of one of said flanges at the edge of one of said apertures whereby, as said member is moved axially, said protrusion compresses said member to allow said protrusion to pass through said apertures for abutment with another of said opposite side surfaces of one of said flanges.

3,884,451

MIXING APPARATUS AND METHOD

Donald G. Stenmark, Houston, and Raymond L. Heinrich, Baytown, both of Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Jan. 17, 1973, Ser. No. 324,458
Int. Cl. B29b *1/06*
U.S. Cl. 259—191 **14 Claims**



1. A rotatable core means adapted and constructed to be utilized in an extruder barrel means comprising in combination:

a. an extruder screw means having a succession of individual spaced apart, offset, discontinuous, helical flights disposed on said screw means to form channels between said flights;

b. each successive flight being centered in a channel of preceding flights;

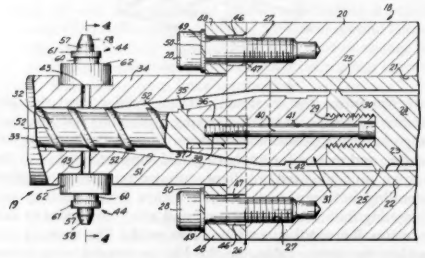
c. said flights having the narrowest-width-channel within the range from about −0.25 to about three diameters of said core means, the diameter of said core means including said flights.

3,884,452

BLOW-MOLDING PLASTICIZING MANIFOLD

George C. Britten, Floral Park, N.Y., and Arion Mancuso, Ashland, Mass., assignors to Manbritt Industries, Inc., Amityville, N.Y.

Filed Sept. 25, 1972, Ser. No. 291,651
Int. Cl. B29b *1/06*
U.S. Cl. 259—192 **22 Claims**



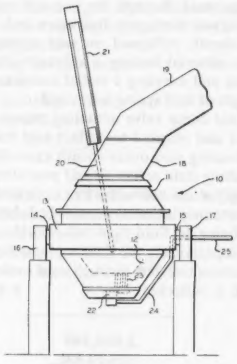
1. A manifold assembly for use in combination with an extruder having first screw means for the plastification of thermoplastic material, the manifold assembly comprising: an elongated distribution manifold having a longitudinally extending internal passageway circular in any cross-section of working area and a plurality of exit ports extending transverse to the axis of the manifold; second screw means mounted for rotation axially and centrally of the passageway in said manifold; and, drive means for rotating said second screw means; whereby the thermoplastic material which is plasticized by said first screw means of said extruder will be continuously masticated while being distributed through said distribution manifold until such time as said material is injected or extruded through one or more of said exit ports.

3,884,453

BOTTOM BLOWN STEEL CONVERTER AND MEANS FOR CONTROLLING INJECTION OF POWDERED MATERIAL WITH PROCESS GASSES THEREIN

Jai K. Pearce, Pittsburgh, Pa., and Frithjof Eichinger, Boxtehude, Germany, assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 207,889, Dec. 14, 1971, abandoned.
This application Mar. 14, 1973, Ser. No. 341,105
Int. Cl. C21c *5/34*
U.S. Cl. 266—35 **28 Claims**



1. For use in a system which is adapted to convey finely divided materials from a pressurizable storage vessel through a material flow metering valve and then a nozzle chamber in which pressure is maintained relatively constant over a range of process gas flows and back pressures, and in which the material is entrained by gas from the nozzle and thence conveyed to tuyeres which allow injection of the gas and material beneath the surface of molten metal in a vessel for converting ferrous metal to steel, the improvement comprising:

a. said material flow metering valve means has a rotary element with a flow-through opening therein,

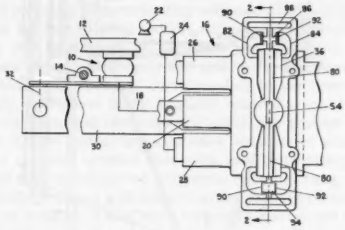
b. pliable valve seat means in sealing engagement with said rotary element and cooperating therewith, said valve seat means having a cavity means that responds to gas pressure therein by increasing the sealing pressure between said seat means and said rotary element, and

c. a high pressure source, gas conducting means intercommunicating said cavity to said high pressure source means, the pressure of said source being in excess of pressure in said nozzle chamber means whereupon if the pressure in said nozzle chamber exceeds the pressure in said storage vessel said cavity will be pressurized to enhance said sealing engagement.

3,884,454
AIR SPRING SYSTEM AND DAMPED AIR VALVE THEREFOR

David G. Passmore, Sparta, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Oct. 29, 1973, Ser. No. 410,466
Int. Cl. F16f 5/00
U.S. Cl. 263—65 D 10 Claims



1. In a system for controlling the height of a vehicle with respect to an axle wherein an air spring supports the vehicle on an axle and an air valve controls the flow of air to the air spring and wherein the air valve comprises:

a valve body having a sealed air chamber, and a sealed fluid filled damping chamber including opposite side walls and an end wall;

valved conduits in said valve body coupling said air spring with a source of air pressure and coupling said air spring with the atmosphere for exhausting air from said air spring;

means for actuating the valves in the valved conduit responsive to changes in the height of the said vehicle with respect to said axle, said control means including a common actuator shaft in said air and damping chambers and means for applying a torque to said shaft;

means in said damping chamber to damp the movement of said shaft, said damping means including at least one vane in said damping cavity, said vane being mounted in the said damping cavity for movement between opposite side walls thereof with the dimensions of said vane approximating that of said damping cavity portion in which said vane moves to permit slow passage of fluid around said vanes upon movement of said vanes within said cavity;

the improvement which comprises:

by-pass conduits extending from said opposite side walls of said damping chamber to a central portion of said end wall; and

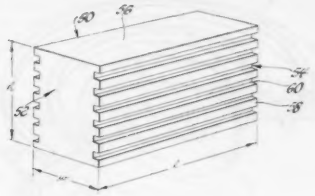
check valve means in said by-pass conduits to prevent the flow of fluid through said by-pass conduits from said side walls to said end walls, but to permit the flow of fluid in an opposite direction in said by-pass conduit, whereby said vane is damped in the movement thereof from a central position to either of said side walls, but is undamped in return movement to the central position.

3,884,455
HIGH EFFICIENCY ENERGY ABSORBER

Peter A. Weller, and Cass V. Curtis, both of Durham, N.H., assignors to McCord Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 245,438, April 19, 1972, abandoned. This application Mar. 29, 1973, Ser. No. 345,915
Int. Cl. F16f 1/36; B60r 19/06
U.S. Cl. 267—140 6 Claims

1. An energy absorbing device comprising: a compressible energy-absorbing block having a substantially rectangular cross section; said block having dimensions of width *w*, height *h* and length *l*; said block having integral columnar ribs disposed on two parallel, opposed faces of said block for increasing the compressive strength of said block in the longitudinal *l* direction thereof; said faces being defined by the dimensions *l* and *h* and said ribs extend in parallel relationship to the direction of said *l* dimension; said block including two parallel,

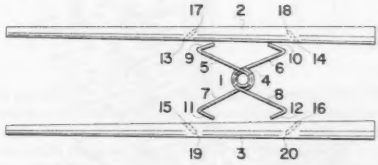


opposed surfaces defined by the dimensions *l* and *w* and which are planar; said columnar ribs having a width *b* and a depth *c* and are spaced from each other by a distance *a*; said width *b* being slightly greater than said distance *a*.

3,884,456
SELF-ATTACHING COUPLING SPRING FOR THE COUPLED CHOPSTICKS

Hyok Sang Lew, 1620 E. Blacklidge Dr., No. 6, Tucson, Ariz. 85719

Filed Dec. 26, 1973, Ser. No. 427,805
Int. Cl. F16e 1/12
U.S. Cl. 267—156 6 Claims



1. A self-attaching coupling spring for coupling a pair of elongated members used for grasping, said coupling spring comprising:

a. a first coil spring having a first pair of arms extending therefrom, the end of each of said first pair of arms is bent in direction generally same as said arm is straightened with respect to the extension of said arm forming said first coil spring,

b. a second coil spring having a second pair of arms extending therefrom, the end of each of said second pair of arms is bent in direction generally same as said arm is straightened with respect to the extension of said arm forming said second coil spring; and

c. means for attaching said first and second coil springs to one another in axial alignment wherein the general direction of said first pair of arms is opposite to the general direction of said second pair of arms.

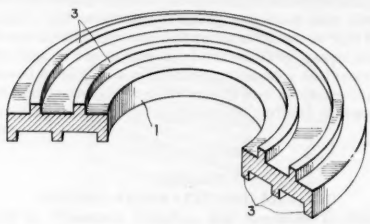
3,884,457
SPRING IN THE FORM OF STACKED SHEET METAL PLATES

Toma D. Leko, P.O. Box 1569, Boston, Mass. 02104

Filed May 14, 1973, Ser. No. 331,013
Claims priority, application Germany, May 24, 1972, 2225131
Int. Cl. F16f 3/02
U.S. Cl. 267—162 1 Claim

1. A spring in the form of stacked sheet metal plates comprising a number of resilient ribbed metal plates provided with ribs, said ribs extending curvilinearly across both faces of the said ribbed metal plates, said ribs on one face being in stag-

gered relation to the ribs on the opposite face, and flat metal plates having no ribs on either face thereof, said ribbed metal



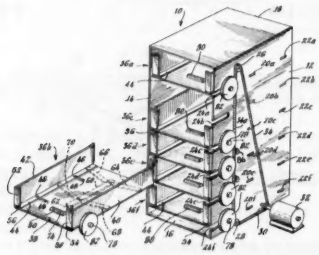
plates being stacked with flat metal plates in between them, and means for maintaining said plates in stacked relation.

3,884,458

COLLATOR WITH REMOVABLE BINS

Peter M. Ryland, Ridgefield, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 14, 1973, Ser. No. 424,845
Int. Cl. B65h *39/02*
U.S. Cl. 270—58 **10 Claims**



10. A collator arrangement: comprising

a frame;

a plurality of individual sheet stack containing bins each having a sheet dispensing means mounted thereon and each being adapted to dispense individual sheets from one end thereof and to be loaded with sheets from the other end thereof;

means for selectively removably mounting said bins on said frame, each bin having an increased sheet capacity when the adjacent bin is removed; and

a common drive means adapted to drive the sheet dispensing means carried by each of said bins.

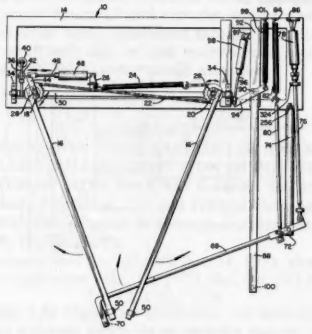
3,884,459

SHEET FOLDING MECHANISM

David P. Gunn, Fort Lauderdale, and Fred May, Boca Raton, both of Fla., assignors to Gunn-May Manufacturing, Inc., Fort Lauderdale, Fla.

Filed Oct. 26, 1973, Ser. No. 410,120
Int. Cl. B65h *45/00*
U.S. Cl. 270—61 R **19 Claims**

1. A sheet folding mechanism, comprising: a supporting structure; a pair of separated work supporting arms; gripping means attached to one end of each of said arms for gripping a work piece; spaced first pivotal means attached to the other end of each of said arms for permitting movement of said arms in a predetermined plane; second pivotal means mounting said first pivotal means for permitting movement of said arms in a second planar direction normal to said first plane; means operating said arms for movement from a first position in which said one ends are lowered and in close proximity to each other for attachment to said gripping means of an elongated work piece to be folded, and for movement to another position in which the said one ends are disposed in spaced, elevated, relation to retain the attached end of the work piece in stretched condition and the lower end of the work piece



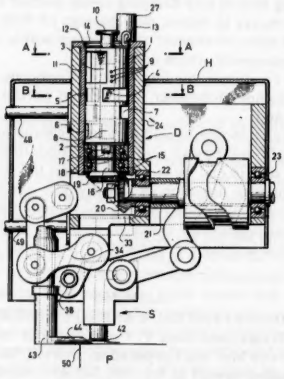
spaced from the floor; folding means; means mounting said folding means for movement into engagement with the stretched work piece forming one or more folds therein while the outer ends of the work supporting arms are brought into proximity with each other in an elevated position; and means operable to release said work gripping means.

3,884,460

AIR DISTRIBUTING DEVICE FOR A PNEUMATIC SHEET-FEEDING DEVICE

Jaroslav Jiruse, Blansko, Czechoslovakia, assignor to Adamovske strojirny, narodni podnik, Adamov, Czechoslovakia

Filed May 23, 1973, Ser. No. 363,005
Claims priority, application Czechoslovakia, May 26, 1972, 3617/72
Int. Cl. B65h *3/08*
U.S. Cl. 271—98 **7 Claims**



1. Apparatus for the distributing of air in a pneumatic sheet feeding device for printing machines, wherein a plurality of sheets are located in a pile, the sheet feeding device having a housing, a drive shaft mounted in said housing, at least one suction cup linked to said housing and connected to said drive shaft for reciprocating movement with respect to the top of the pile of sheets, and at least one nozzle for the delivery of air under pressure to the edge of the sheets of said pile, said

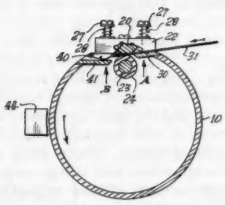
air distribution apparatus comprising a body having a bore, a valve member rotatably mounted in said bore, said valve member having an axial bore defining a central chamber and a plurality of recesses formed on its circumference being intersected by said central chamber, said recesses defining with said body a plurality of distributing channels, said body having an opening for the inlet of pressurized air and an inlet for the exhaust of air under vacuum communicating with said distribution channels for providing air under pressure to or removing air under vacuum from said chamber, and a plurality of outlet openings communicating with said distribution channels and leading to said suction cups and said nozzles for delivery and withdrawal of air therefrom, a tubular sleeve interposed between said body and said valve, said sleeve having a plurality of openings corresponding to the openings in said body, said sleeve being rotatable relative to said body to selectively align said openings and adjust the passage therethrough, means connecting said valve member to said drive shaft for conjoint rotation therewith, said distributing channels, said inlet openings and said outlet openings being axially and radially arranged with respect to the axis of said chamber so that on rotation of said valve member air is caused to flow between the edges of said sheets to separate said sheets, suction is caused to be applied to said suction cups to lift said sheets and air is thereafter caused to flow into said suction cups to release said sheets in a cyclical sequence.

3,884,461

FACSIMILE DRUM FEED

Frank W. Hauser, Santa Monica, Calif., assignor to Telautograph Corporation, Los Angeles, Calif.

Filed Apr. 22, 1974, Ser. No. 462,793
Int. Cl. B41f *21/04*
U.S. Cl. 271—277 **13 Claims**



1. Apparatus for holding an edge of a flexible sheet on the surface of a drum mounted on a shaft for rotation of said drum on an axis parallel to a curved surface thereof, said apparatus comprising:

a slot on the surface of said drum parallel to said axis,

an elongated bar and feed roller combination, said bar being disposed parallel to the axis of said roller and in contact therewith, said combination being mounted flush on said drum in said slot with both the axis of said roller and the center line of said bar being disposed in a plane passing through said drum at approximately a right angle with a plane tangent to said drum surface, and

means for turning said feed roller while said drum is stationary and said sheet is being fed into said slot from one side of said combination with said edge of said sheet moving into contact with both said bar and said roller.

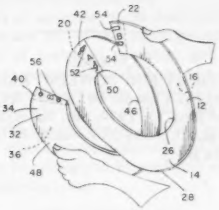
3,884,462

MOBILE GEOMETRICAL FORM

Francis Rebajes, San Miguel, 45, Torremolinos-Malaga, Spain

Filed Dec. 26, 1973, Ser. No. 428,201
Int. Cl. D04d *9/04*
U.S. Cl. 272—8 R **22 Claims**

1. A mobile geometrical form comprising a double-sided continuous strip of material, each side having four points of inflection to thereby result in four surface portions having successive concave and convex contours, opposing surface



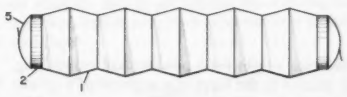
portions of said strip between the same inflection points having opposing concave and convex contours.

3,884,463

PNEUMATIC COLLAPSIBLE EXERCISING DEVICE OF THE ACCORDING TYPE

Roger J. Malatesta, 202 Tyrone Ave., Wilmington, Del. 19804

Filed Mar. 7, 1973, Ser. No. 338,964
Int. Cl. A63b *23/02, 23/04, 21/00*
U.S. Cl. 272—79 C **11 Claims**



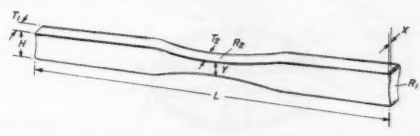
1. A pneumatic exercise device of the class described which is comprised of a one piece flexible collapsible body of accordion type two side pieces attached and sealed to the ends thereto, and a variable means in at least one of said pieces for allowing varying amounts of air to exit upon compression of said device for permitting varying amounts of air to enter upon tension of said device by a user during an exercise program, said variable means being adjustable to change the force required to make air exit upon closing and enter upon tensioning the collapsible body during an exercise program by a user.

3,884,464

EXERCISER

George D. Evangelos, 707 85th St., Miami Beach, Fla. 33139

Filed Sept. 12, 1973, Ser. No. 396,363
Int. Cl. A63b *23/00*
U.S. Cl. 272—79 R **9 Claims**



1. An exerciser device comprising a rigid, single, elongated member having no moving parts:

A. a length capable of being grasped at each end thereof by the hands of the outstretched arms of a user and the length being such that the angle formed by the arms of the user with the device being held straight out is between 80° and 15°;

B. a central portion which is capable of being held with the clasp of the user's hand;

C. end portions which are capable of being held within the grasp of partially closed hands of the user;

D. a yieldable surface whereby the said member may be firmly but confortably pressed against the body of the user; and

E. a weight per average linear inch of length of from 1.0 to 2.4 oz.

3,884,465
WEIGHT FOR BOWLING BALLS
Leon S. Milsner, 162 Camelia Dr., Daly City, Calif. 94015
Filed June 13, 1974, Ser. No. 478,983
Int. Cl. A63d *5/00;* **A63b** *37/00*
U.S. Cl. 273—54 B **5 Claims**

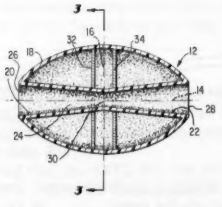
1. A practice weight for a bowling ball comprising,

a body shaped in the form of a segment of a sphere, having a dished bottom complementing a segment of the spherical surface of a bowling ball,

a thumb hole through said weight,

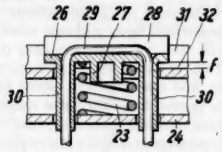
a seat formed by a dent on one side of the periphery of said weight tapering toward said hole, for forming a finger rest in relation to the finger holes of the bowling ball.

3,884,466
GAME BALL
Richard A. MacDonald, Del Haven; James A. MacDonald, Villa, both of N.J., and Joseph J. Andrews, Philadelphia, Pa., assignors to Thingamajig Corporation, Vineland, N.J.
Filed Apr. 27, 1973, Ser. No. 354,935
Int. Cl. A63b *41/00*
U.S. Cl. 273—65 EC **3 Claims**



1. A ball having an oblate spheroid contour being substantially symmetrical about a longitudinal axis and adapted to be manually thrown through the air, having a through passage in said longitudinal direction, said passage forming a cross-sectional air passage which has maximum crosssectional area at opposing longitudinal ends of said ball and continuously decreasing to a minimum cross-sectional area at substantially a mid-point region between said opposing ends.

3,884,467
DEVICE FOR HITTING A BALL, SHUTTLECOCK OR THE LIKE
Reinhold Sommer, Helgolandring 68, 4300 Essen, Germany
Filed Mar. 31, 1972, Ser. No. 240,115
Claims priority, application Germany, Apr. 7, 1971, 2116920
Int. Cl. A63b *51/00*
U.S. Cl. 273—73 D **8 Claims**

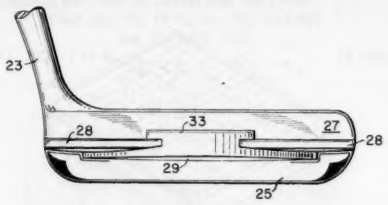


1. A racket comprising an open, peripheral head frame having its ends extended beyond one side at its throat portion and continuing parallel to each other to form a handle for said racket, and a cross-piece extending between the sides of said head frame at said throat portion and complementary to the opposite side of said head frame, thereby forming a closed loop head frame, at least said head frame and throat portion having an external channel formed therein, said head frame and throat portion being formed with string holes therethrough, an array of strings extending in longitudinal and transverse directions across said peripheral head frame to form a striking surface, a plurality of the centrally located strings in at least the longitudinal direction extending from said throat portion to said opposite side of said head frame, said centrally located strings being connected to said head frame by first string connecting means, said first string connecting means connecting said centrally located strings to said frame comprising resiliently cushioned segments having inner surfaces and outer surfaces, coil springs seated in said channel between said frame and the inner surfaces of said segments to cushion movement of said segments and resiliently tension said centrally located strings, tubular string guide means in said channel through which said strings pass and are guided around the outer surfaces of said segments, the centrally located strings on the side adjacent said throat portion passing through said cross-piece and outwardly through said frame and connected to second string connecting means, said second string connecting means comprising spring-pressed segments seated in the channel of said frame at said throat portion and coil springs in said channel between said frame and the inner surfaces of said segments, the remaining strings in the longitudinal direction passing through the string holes in the frame and being connected directly to the frame.

3,884,468
GOLF CLUB
Raymon W. Cook, San Antonio, Tex., assignor to Ray Cook Golf Putters, Inc., San Antonio, Tex. The portion of the term of this patent subsequent to May 21, 1982, has been disclaimed.
Continuation-in-part of Ser. No. 672,766, Oct. 4, 1967, abandoned. This application Sept. 10, 1969, Ser. No. 867,107
Int. Cl. A63b *53/04*
U.S. Cl. 273—78 **5 Claims**

1. In a golf club head consisting of an upstanding blade having a front face and a rear face with a flange extending rearwardly of the said blade, said flange having a top and a rear face, a longitudinally and horizontally extending groove in the rear face of said blade extending completely across the rear face thereof, a flange groove extending downwardly into

the top of said flange to an approximate uniform depth and terminating rearwardly substantially across the entire rear



face of said flange, said flange groove terminating upwardly in said longitudinally and horizontally extending groove.

3,884,469

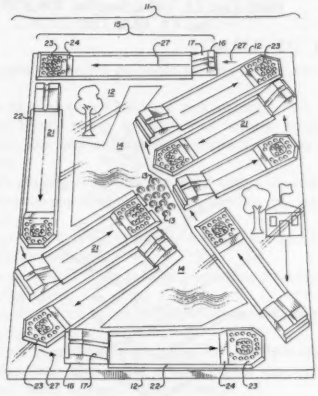
PORTABLE TABLE-TOP MINIATURE GOLF GAME PROVIDED WITH REARRANGEABLE HOLE MODULES AND SEPARATE GREEN PUTTING BOARD

Hershel D. Morton, P.O. Box 4611 Ave. C, Austin, Tex. 78751

Filed July 3, 1974, Ser. No. 485,358

Int. Cl. A63f *7/06, 7/10*

U.S. Cl. 273—87.2 **6 Claims**



1. A portable indoor table-top miniature golf game with associated movable modules to allow rearrangeable hole combinations in a table-top game simulating miniature golf, said portable indoor table-top miniature golf game comprising:

A. a flat golf course playing field board provided with a plurality of ball hazard penalty entrapments;

B. a plurality of movable rearrangeable and recombinable hole module assemblies each said movable rearrangeable hole module assembly having

1 an elevated tee-off ramp block having a ball directing and propelling ramp surface inclined down one side,

2 a ball conducting fairway board originating at the bottom of said ball directing and propelling ramp surface, and

3 an elevated ball entrapment green of less height than said elevated tee-off ramp block and situated at the end of said ball conducting fairway, said elevated ball entrapment green having

(a) a ball riser incline facing said elevated tee-off ramp block, and

b. an elevated entrapment green top surface provided with a plurality of ball entrapment and primary score determining depressions;

C. a separate portable secondary putting green game board provided with

1. a putting tee-off depression,

2. a ball conducting putting runway originating at said putting tee-off depression, and

3. a plurality of secondary score determining depressions situated at the end of said ball conducting runway;

D. a plurality of L-shaped miniature golf clubs suitably designed to be swung with one hand of a game player to impact and propel a miniature table-top golf ball from the tee-off point of the various movable hole modules of the course and the putting tee-off depression; and

E. a plurality of miniature table-top golf balls of suitable diameter to be entrapped by said ball entrapment and score determining holes.

3,884,470

FRANGIBLE TARGET

Peter O. Paulson, Calgary, 2124 Palisdale Rd. S.W., Alberta, Canada

Continuation-in-part of Ser. No. 199,332, Nov. 16, 1971, abandoned. This application Nov. 6, 1972, Ser. No. 303,999

Int. Cl. F41j *1/00*

U.S. Cl. 273—105.4 **4 Claims**

1. A saucer-shaped, thin-walled, frangible target for use as a flying target formed from a sulfur composition selected from the group consisting sulfur with additives having the strength characteristics of n-decane, napthalene, biphenyl, ethane dithiol, lignin sulfonate, sodium sulfide or iron sulfide admixed therewith whereby said target initially has a monoclinic crystalline structure which matures to convert to a rhombic crystalline structure.

3,884,471

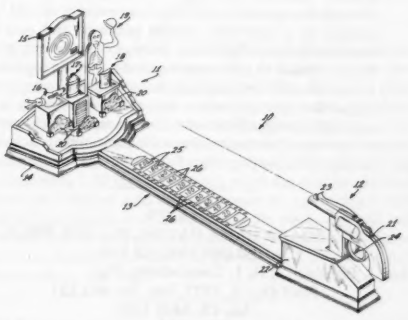
PNEUMATIC PROJECTOR AND PNEUMATICALLY RESPONSIVE TARGETS

Donald J. Maurer, Torrance, and Dermot F. Sims, Palos Verdes Peninsula, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 11, 1974, Ser. No. 441,537

Int. Cl. F41j *7/00*

U.S. Cl. 273—101.2 **16 Claims**



1. A toy shooting gallery having a plurality of targets comprising:

shooting means for shooting at a plurality of targets, said shooting means having sighting means and a pneumatic source for actuating a plurality of targets;

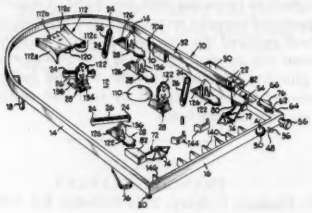
target means having a plurality of targets located thereon; and

connecting means remote from said sighting means and coupling said shooting means to said target means for respectively transferring the output of said pneumatic source to said respective plurality of targets and actuating said targets upon proper aiming of said shooting means.

3,884,472
GAME APPARATUS

Burton C. Meyer, Downers Grove, Ill., assignor to Marvin Glass Associates, Chicago, Ill.

Filed Jan. 22, 1973, Ser. No. 325,584
Int. Cl. A63d *3/02*
U.S. Cl. 273—121 R **3 Claims**



1. A pinball type game, comprising:

means defining a playing surface over which a playing object, such as a ball, may be propelled, with an aperture in said playing surface;

a playing object to be propelled upon said playing surface; a playing object propelling device located in proximity to said playing surface so as to be capable of propelling a playing object upon said playing surface; and

target means mounted on said playing surface, including a lever member pivotally mounted intermediate its ends adjacent said aperture for pivotal movement about an axis generally parallel to said playing surface, the lever member comprising a target portion on one side of said axis and an actuating portion on the other side of said axis, said target portion normally resting on said playing surface and said actuating portion substantially covering said aperture in the playing surface, said actuating portion being smaller than said aperture, said aperture being larger than a playing object, with a playing object being of sufficient weight to cause the lever member to pivot when the playing object moves on top of the actuating portion thereof whereby the playing object passes through the aperture and effects movement of said target portion to a generally upright position, and said lever member having a bell crank portion of sufficient size and shape relative to said aperture and a playing object so as to overlie and rest upon portions of the playing surface about the aperture when said target portion is in said generally upright position to define said upright position of the target portion while at the same time blocking the passage of a playing object through said aperture.

3,884,473
PEG BOARD GAME HAVING PLAYER PIECE DISLODGING MEANS

Leo J. Pritulsky, R.D. 1, Coopersburg, Pa.

Filed Oct. 1, 1973, Ser. No. 402,121
Int. Cl. A63f *3/00*
U.S. Cl. 273—130 D **8 Claims**

3. An amusement game toy comprising:

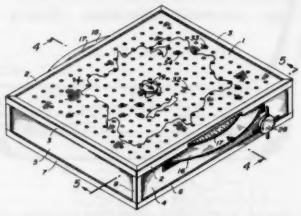
a base;

a playing surface having at least one hole formed therethrough and being horizontally mounted upon said base; spring means mounted on said base beneath said playing surface;

operator controlled means located beneath said playing surface for activating said spring means;

means beneath said playing surface for striking said playing surface;

means for selectively positioning said striking means at various locations beneath said playing surface, said at least one hole being substantially vertically aligned with at least one of said locations; and

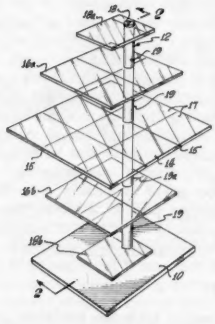


means for transferring the motion of said spring means to said striking means.

3,884,474
MULTI-TIERED GAME BOARD FOR THREE-DIMENSIONAL TIC-TAC-TOE GAMES

James W. Harper, 227 Ave. H, Redondo Beach, Calif. 90277

Filed Aug. 22, 1974, Ser. No. 499,570
Int. Cl. A63f *3/00*
U.S. Cl. 273—130 AC **10 Claims**



1. A multi-tiered game board structure for three-dimensional tic-tac-toe games, comprising:

an odd number of playing surfaces mounted one over the other, with the surfaces located at vertically spaced levels, and including a central surface at the center level and equal numbers of upper and lower surfaces at levels above and below said central surface;

each surface having a playing area defining playing squares arranged in mutually perpendicular rank and file rows containing equal numbers of squares;

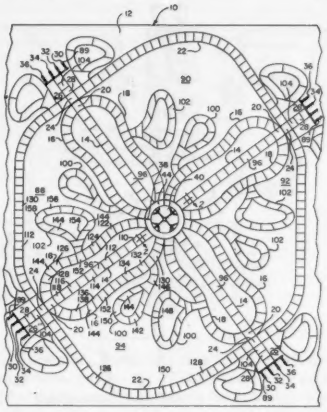
said central surface having at least three rank and at least three file rows, and each upper and lower surface having one less rank and file row than the surface immediately adjacent in the direction of the central surface; and

said surface being disposed on a common, substantially vertical, axis passing through the centers of the several playing surfaces and with the rank and file rows of each playing surface in parallel alignment with the rank and file rows of all other playing surfaces.

3,884,475
RAILROAD BOARD GAME

James M. Munro, 101 Friendship Rd., and Donald Gill, 161 Friendship Rd., both of Drexel Hill, Pa. 19026

Filed Jan. 10, 1973, Ser. No. 322,487
Int. Cl. A63f 3/00
U.S. Cl. 273—134 G 11 Claims



1. In a game, including movable playing pieces, the combination of

A. a flat playing board having a top surface,
   1. said board being marked with indicia to generally divide the top surface into distinct, similar playing areas,
   2. each playing area being marked with indicia to define a headquarters area and a plurality of segmented tracks;

B. a shop area carried upon the top surface and having a peripheral boundary,
   1. said shop area being medially positioned relative to the playing areas,
   2. said shop area being in stationary relationship to the playing board,
   3. said shop area being of cylindrical configuration,
      a. said shop area being positioned on the top surface and rising upwardly therefrom,
   4. said shop area being provided with at least one track extension;

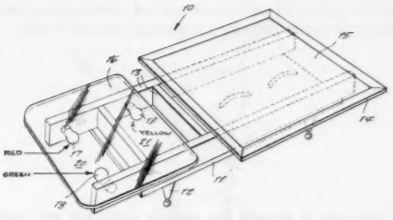
C. a roundhouse positioned upon the top surface,
   1. said roundhouse surrounding at least a portion of the peripheral boundary of the shop area,
   2. said roundhouse being rotatable about the shop area,
   3. some of said segmented tracks defining paths to the roundhouse,
   4. said roundhouse including means to move playing pieces from one track to another, and
   5. said roundhouse including means to permit the passage of playing pieces into the shop area.

3,884,476
PUZZLE TABLE

Carl D. Sanders, 362 Delta St., Memphis, Tenn. 38109

Filed Apr. 19, 1974, Ser. No. 462,330
Int. Cl. A63f 9/00
U.S. Cl. 273—157 R 3 Claims

1. A puzzle table, comprising in combination, a platform in a horizontal plane supported upon a plurality of vertically extending legs, said platform supporting a plurality of longitudinally extending and transversely extending beams, said beams at one end supporting a frame unit where a puzzle may be worked upon, and a glass unit adjacent thereto whereupon puzzle pieces may be shuffled, said frame unit where puzzles may be worked upon comprises a frame member around a central material permitting light to glow therethrough, said

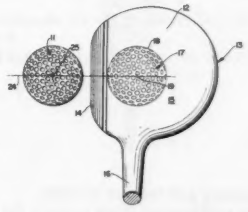


central material having a light therebeneath, said glass unit where puzzle pieces may be shuffled comprising a heavy glass of clear type placed upon said beams, and different colored lamps located below said glass, said lamps being supported by said beams.

3,884,477
AID FOR DRIVING GOLF BALLS

John Bianco, 521 E. Ash, Caldwell, Idaho 83605

Filed Aug. 20, 1973, Ser. No. 389,781
Int. Cl. A63b 69/36
U.S. Cl. 273—183 D 2 Claims



1. A glof ball driving club wherein the head thereof includes a striking face intersecting a generally horizontal upper surface on the club head, marking means in the form of a plain circle devoid of configuratiion marking within the periphery of the circle on the upper surface of the club head, the intersection of said striking face and upper surface being tangent to said plain circle, and the diameter of said plain circle being approximately 1.68 inches whereby when the club head is laid adjacent to a ball of said diameter prior to a swinging stroke the adjacent circular configurations of the circle and golf ball as viewed by the player coact optically to establish a directional axis accurately related to the line of flight of the ball when struck by the club.

3,884,478
GOLFER'S TRAINING DEVICE

Wendell P. Buzan, Pico Rivera, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

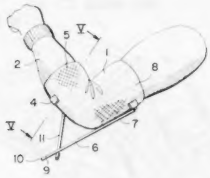
Filed Sept. 3, 1974, Ser. No. 502,443
Int. Cl. A63b 69/36
U.S. Cl. 273—183 B 2 Claims

1. A golfer's training device, comprising

a sleeve of pliable material adapted to cover the elbow of one arm of a golfer;

a magnet on the sleeve in the area of the lower end thereof; and

an arm member pivotally affixed at one end to the sleeve in the area of the upper end thereof and having a piece of metal at the other end of the arm member, whereby when



the arm is straight the magnet holds the arm member adjacent the arm and when the elbow is bent the arm member falls away from the arm to indicate to the golfer that he has bent his arm.

3,884,479

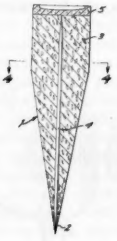
DISINTEGRATING GOLF TEE

Ambrose Gordos, 4301 E. 2nd St., Apt. 1E, Long Beach, Calif.

Filed Mar. 22, 1974, Ser. No. 453,788

Int. Cl. A63b *57/00*

U.S. Cl. 273—212 **1 Claim**



1. A disintegrating golf tee that includes:

a. an elongate rigid tapered shank having a flat first end and a second pointed end, said shank formed from grass seed and a water soluble binder;

b. an elongate longitudinally extending rigid reinforcing member situated within the interior of said shank; and

c. a ball support having first and second oppositely disposed surfaces, said support formed from a plastic material, said first surface being concave and capable of supporting a golf ball in a driving position thereon, said second surface bonded to said first end of said shank, and said ball support serving the dual function of both supporting a ball and preventing injury to the hand of a user due to contact with said reinforcing member in the event said shank should break when being forced into the ground.

3,884,480

RECORD CHANGER SHAFTS OF AUTOMATIC RECORD PLAYERS

Raul Antonio Vega, Buenos Aires, Argentina, assignor to Winco Sociedad Anonima Industrial, Buenos Aires, Argentina

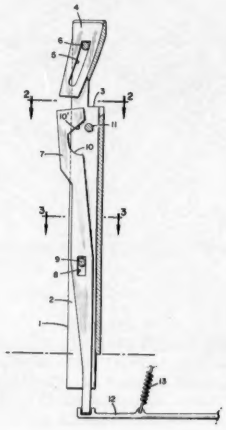
Filed Jan. 16, 1973, Ser. No. 324,232

Claims priority, application Argentina, Feb. 3, 1972, 240367

Int. Cl. G11b *17/04*

U.S. Cl. 274—10 S **4 Claims**

1. An automatic record player changer mechanism comprising a cylindrical shaft having a grade near its top end, where the record is locked until it is freed by being pushed, said shaft being straight and said grade being shaped through an eccentric rabbet defining a half-moon shaped support; a longitudinal groove having sides and a bottom within said shaft opposite to the said rabbet and running the entire length of the shaft, a tongue of two laminar identical pieces, each being



independantly freely disposed and movably controlled by a single transverse shank through a longitudinal opening in said laminar pieces; a lever within the groove having a fulcrum near the midpoint of the lever, said lever widening at its top end near the plane of the grade, and being connected at its lower end to a lever connected to the pick-up mechanism.

3,884,481

DEVICE FOR LIFTING AND LOWERING A PICK-UP ARM OF A RECORD PLAYER

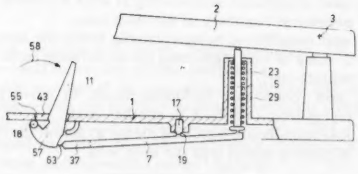
Kurt Eisemann, Berlin, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 18, 1973, Ser. No. 398,485

Claims priority, application Germany, Oct. 6, 1972, 2249178

Int. Cl. G11b *3/00*

U.S. Cl. 274—23 R **1 Claim**

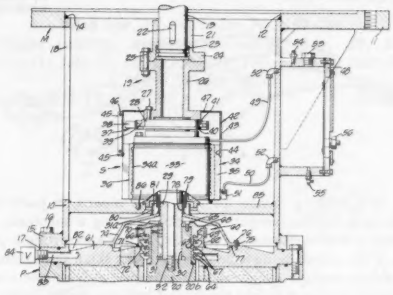


1. A device for lifting and lowering a pick-up arm of a record player of the type comprising a tilting handle means for manually actuating the device and an integral lowering and lifting pin, said device comprising a plastic molding having a two-armed lever portion, a mounting portion connected to said lever portion by a film-type joint, a lifting pin portion connected to said lever portion by a filmtype joint at a first end of the lever, and a tilting handle means portion connected to said lever by a film-type joint at an end of the lever opposite to said first end.

3,884,482
COOLED SEAL CARTRIDGE

Rowland E. Ball, Long Beach, and Winfred J. Wiese, Whittier, both of Calif., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 8, 1973, Ser. No. 338,807
Int. Cl. F16j *15/40*
U.S. Cl. 277—17 **13 Claims**



1. A seal assembly applicable to a rotary shaft to prevent fluid leakage between said rotary shaft and a case comprising: a housing having means for mounting the housing on said case, a stub shaft rotatable in said housing and having means connectable to said rotary shaft, said housing including means defining a seal chamber between said housing and said stub shaft, mechanical said means in said chamber for preventing fluid leakage between said stub shaft and said housing, said mechanical seal means forming with said housing a cooling fluid chamber, said housing having an inlet for said cooling fluid chamber and an outlet for said cooling fluid chamber, a cooling jacket disposed about said housing and having means providing a flow path therein for cooling fluid flow, means connecting one end of said flow path to said inlet and means connecting the other end of said flow path to said outlet, whereby cooling fluid may flow from said outlet through said flow path, through said inlet, and through said cooling fluid chamber from said inlet to said outlet, and cooling fluid impelling means rotatable with said stub shaft for causing cooling fluid flow through said cooling fluid chamber from said inlet to said outlet, wherein said housing has a cylindrical outer surface, said cooling jacket being in the form of a sleeve applicable endwise to said housing, said housing and said sleeve having means forming end seals therebetween, and one of said housing and said cooling jacket having groove means in its surface between said end seals and confronted by the other of said cooling jacket and said sleeve, said groove means providing said flow path for cooling fluid flow.

3,884,483
ANNULAR SEAL FOR COAXIAL TUBULAR MEMBERS

Werner H. Fengler, and Richard R. Fengler, both of 23651 Fordson Dr., Dearborn, Mich. 48124

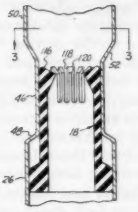
Division of Ser. No. 304,853, Nov. 8, 1972, abandoned. This application July 2, 1973, Ser. No. 375,737
Int. Cl. F16j *15/18*
U.S. Cl. 277—208 **4 Claims**

1. An elongated annular sealing element adapted to be pushed into simultaneous sealing engagement between an elongated cylindrical constriction in the elongated internal cylindrical surface of a hollow outer member and a cylindrical inner member reciprocable relatively thereto, said sealing element comprising

an elongated spool-shaped body of resilient material having therethrough a bore with an elongated internal cylindrical sealing surface adapted to sealingly engage the cylindrical inner member,

said body near its opposite ends having axially-spaced annular enlargements adapted to sealingly engage said internal cylindrical surface externally of the constriction thereof and having a reduced-diameter neck portion extending between said enlargements,

said neck portion having thereon an elongated external cylindrical sealing surface extending circumferentially



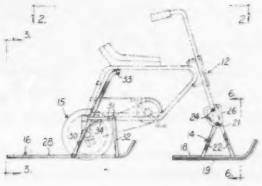
therearound and adapted to sealingly engage the elongated cylindrical constriction,

and means associated with one of said enlargements and responsive to the passage thereof into the constriction for enabling temporary contraction of said one enlargement and responsive to the emergence thereof from the constriction for enabling subsequent expansion of said one enlargement.

3,884,484
CONVERSION SYSTEM FOR PEDAL-OPERATED CYCLES

Emanuel J. Uhlyarik, 23309 Westbury Dr., St. Clair Shores, Mich. 48079

Filed May 1, 1973, Ser. No. 356,078
Int. Cl. B62k *13/00*
U.S. Cl. 280—7.12 **1 Claim**



1. An improvement in a conversion system for pedal-operated cycles of the type having a frame and including a front fork, and a rear fork and having a front axle and a rear axle mounted thereon, each of said axles carrying a conventional bicycle wheel, said improvement being for the conversion of said cycle from its traditional summer use to a winter use sled having forward and rear ski mechanisms, with said forward ski mechanism being fixedly but removably mounted on said front fork in place of said front wheel, said rear ski mechanism being fixedly but removably mounted to said frame at the rear fork thereof, and a winter use rear driver wheel mechanism being affixed to the rear fork of said cycle in lieu of the rear wheel thereof, said improvement comprising improved rear ski, rear driver wheel, and front ski mechanisms, and including a rear ski mechanism having two skis mounted on opposite sides of said winter use rear driver wheel mechanism, a frame member joining said two skis together which extends upwardly above and transversly across said rear driver wheel, said transverse portion of said frame member joined to said cycle frame above said rear driver wheel mechanism, said driver wheel mechanism including a pair of brackets fixedly mounted to said cycle frame on opposite sides of the rear fork thereof, said bracket means defining open-ended

downwardly extending circularly arcuate slots with the center of said arc being at the center of the pedal sprocket of said cycle, with the axle of said winter use rear driver wheel movable up and down in said slot means, each of said brackets including a spring mounting means above said slot, a pair of springs each having an upper and lower end with one of said springs mounted on each side of said rear driver wheel and adapted to exert a downward force thereon, with the upper end of each of said springs adjustably attached to said spring mounting means, so that the tension on said springs, and thus the downward force on the driving wheel, can be adjusted depending on ground conditions, and a pair of spring mounting brackets fixedly but rotatably mounted on opposite sides of the axle of said rear driver wheel with the lower end of each of said springs fixedly mounted thereto, and means for mounting said forward ski mechanism on said front fork to allow limited rocking movement thereof, said limiting means including a closed loop member having forward and rearward portions fixedly mounted to said forward ski mechanism, a pin mounted in said front fork above said front axle with said closed loop member being adapted to strike said pin with its forward or rearward portions when the desired limits of movement of such forward ski mechanism are reached.

3,884,485

COLLAPSIBLE ROLLER SKATE

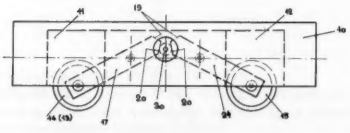
Josua Walle, Zuchwil, Switzerland, assignor to Frespa AG, Herzogenbuchsee, Switzerland

Filed Aug. 20, 1973, Ser. No. 389,536

Claims priority, application Switzerland, Aug. 21, 1972, 12448/72

Int. Cl. A63c *17/20*

U.S. Cl. 280—11.1 R **9 Claims**



1. In a convertable roller skate comprising a thick platform having recesses in its undersurface at least adjacent its opposite ends, roller means adjacent each of said platform ends, and means supporting such rollers for movement from a retracted position fully within said recess to an operative position at least partially protruding from said recess, the improvement wherein said roller supporting means comprises a rigid lever for each such roller means, said lever carrying at one end thereof said roller means for rotation about the roller axis and being pivoted intermediate its ends to said platform on a fixed horizontal axis intermediate the platform top and bottom, whereby pivotal movement of said lever from a generally horizontal position to an inclined position moves the corresponding roller means from said retracted to said operative position and vice versa, each said lever extending in the direction of said opposite roller means and terminating at its free end in proximate spaced relation to the free end of the other lever, and a common detent means supported by said platform for engaging the mutually adjacent ends of said levers to positively hold said levers in their respective inclined positions and thereby said roller means in their respective operative protruding positions, said detent means being releasable to free said lever ends.

3,884,486

BRAKE DEVICE FOR FOOT ROLLER MEANS, IN PARTICULAR ROLLER SKIS

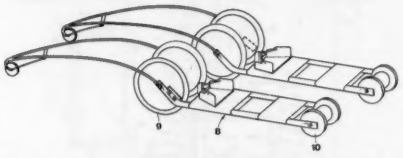
Sven Oscar Wilje, Sluregatan 44, S-79100 Falun, Sweden

Filed Mar. 14, 1974, Ser. No. 451,276

Claims priority, application Sweden, Mar. 20, 1973, 7312031

Int. Cl. A63c *17/14*

U.S. Cl. 280—11.2 **10 Claims**



1. In a braking device for foot roller means, in particular roller skis, for movement of an object along a substrate, including a frame means, secured to and for supporting a portion of the object being rolled on the roller ski; a shaft slidably extending through a bearing on the frame; at least one wheel rotatably mounted on the shaft; and braking means cooperative with the at least one wheel for effecting braking of the foot roller means when at least one wheel contacts the braking means, the improvement including:

the frame being slidable on the shaft in the axial direction of the shaft;

at least one spring means, engaging the wheel and the frame, for resiliently urging the wheel away from the frame; and

the frame being movable against the urging of said spring means to thereby bring the braking means into cooperative contact with the wheel thereby effecting braking.

3,884,487

SKI BRAKE

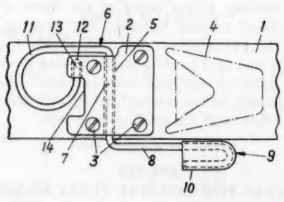
Hans Wehrli, Zurcherstrasse 81, Rapperswil, Switzerland

Filed Apr. 12, 1974, Ser. No. 460,532

Claims priority, application Switzerland, Apr. 13, 1973, 5387/73

Int. Cl. A63c *7/10*

U.S. Cl. 280—11.13 B **7 Claims**



1. In a ski brake securable to the upper surface of a ski and having, laterally of the ski, a brake spur which can pivot about a pivoting axis extending on the upper side of the ski transversely to the longitudinal axis thereof and a holding lever depressible by the ski boot to hold the brake spur in its rest position, the brake spur being pivoted into its braking position by spring action upon removal of the ski boot from the ski binding, the improvement in the brake comprising a wire, bent so that one end part forms the brake spur, a central first shaft portion lying in the pivoting axis and the other end part being shaped into a holding loop forming the holding lever, said holding loop acting as a spring which moves the spur to its braking position and having two alternate positions, one position being against the ski when depressed by the ski boot and the other position extending outwardly from the ski when the

ski boot is removed from the ski binding, the free end of said holding loop forming a second shaft portion which can pivot in its location about an axis arranged spaced from and parallel to the pivoting axis on the upper side of the ski.

3,884,488

RUNAWAY GUARD DEVICE FOR SKIS

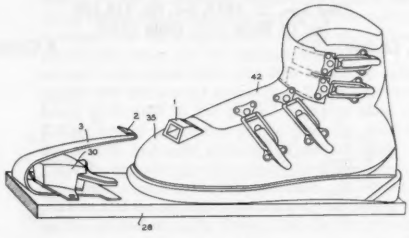
Tilo Herbert Riedel, Gaisberjotrope 73 b, A 5020 Salzburg, Austria

Filed Apr. 25, 1972, Ser. No. 247,424

Claims priority, application Austria, Apr. 29, 1971, 13712/71; July 22, 1971, 6398/71; Feb. 9, 1972, 1058/72

Int. Cl. A63c *9/08*

U.S. Cl. 280—11.35 N **20 Claims**



1. A runaway guard device for skis having a releasable binding for a ski boot including a toe binding and heel clamp means, said guard device comprising at least one detachable rigid holding means including a relatively broad base plate for attachment to the ski adjacent the toe binding, a thin upwardly directed arcuate portion, and a rearwardly directed upper portion having a thickness greater than that of said arcuate portion, said rearwardly directed upper portion being of substantially less width than said base portion and being intended to overlie the toe binding and including an engaging element for engagement with a coupling piece mounted on the toe of the boot, the arrangement being such that the connection at the coupling piece is designed to come apart when the ski is taken off, said guard device being inherently flexible and including portions which may deform elastically, said guard being further characterized by resistance to tensile stress and permanent deformation and also being capable of moving about an imaginery transverse axis in the zone of attachment to the ski owing to its having the form of a band presenting substantially lower resistance in respect to a transverse axis than in respect of the other two axes perpendicular to said transverse axis.

3,884,489

RELEASABLE SKI BINDING

Ulrich Gertsch, Matten, and Ernst Gertsch, Wengen, both of Switzerland, assignors to Gertsch AG, Interlaken, Switzerland

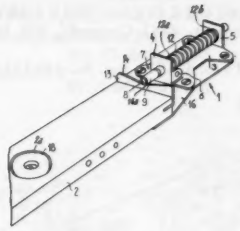
Filed Apr. 23, 1973, Ser. No. 353,389

Claims priority, application Switzerland, May 10, 1972, 6998/72

Int. Cl. A63c *9/08*

U.S. Cl. 280—11.35 K **8 Claims**

1. A releasable ski binding comprising a release plate capable of being anchored to the ski so as to be releasable to all sides, a spring-loaded locking element for releasably holding at least one end of the release plate against the ski, means for mounting the spring-loaded locking element to pivot about an axis directed transversely with respect to the lengthwise direction of the associated ski, said spring-loaded locking element being provided with a roller, a guide track mounted on the release plate, said guide track being provided with a roller defining at least a central section of the guide track, the spring of said spring-loaded locking element urging said locking element in the normal position of the release plate to bear via



its roller against the roller defining the central section of the guide track, said central section of the guide track being bounded to each side by a raised section.

3,884,490

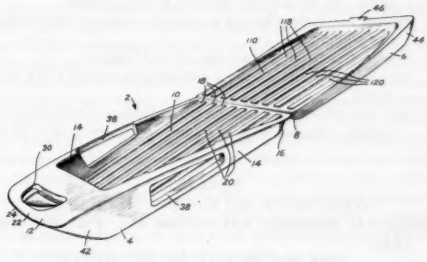
FOLDING SLED

Werner Hellman, Baraboo, Wis., assignor to Flambeau Products Corporation, Baraboo, Wis.

Filed Apr. 3, 1974, Ser. No. 457,483

Int. Cl. B62b *13/16*

U.S. Cl. 280—18 **5 Claims**



1. A unitary, single body collapsible sled, comprising, in combination:

a first sled member having a forwardly and upwardly turned nose portion and a first body-supporting portion, said first body-supporting portion including a first upper wall member and a first lower surface-engaging wall member, said first upper and lower wall members being specially separated by a first hollow region of said first sled member;

a second sled member having an end portion and a second body-supporting portion, said second body-supporting portion including a second upper wall member and a second lower surface-engaging wall member, said second upper and lower wall members being spacially separated by a second hollow region of said second sled member;

a plastic hinge integrally and hingedly connecting said first and second sled members opposite said nose and end portions, respectively, whereby said collapsible sled is operable in an open and folded state, said first and second body-supporting portions being substantially planar in said open state; and

means for locking said first sled member to said second sled member in said folded state;

said first and second upper wall members, said first and second lower surface-engaging wall members and said first and second hollow regions cooperatively defining cushion means for absorbing shock upon said first and second lower surface-engaging wall members to substan-

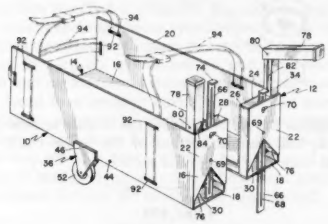
tially avoid transmission of said shock to a user of said collapsible sled.

3,884,491

ADJUSTABLE COLLAPSIBLE CART

Frederick L. Hughart, 4453 Coronado, San Diego, Calif. 92107

Filed Feb. 6, 1974, Ser. No. 440,173
Int. Cl. B62d *21/18*
U.S. Cl. 280—35 **9 Claims**



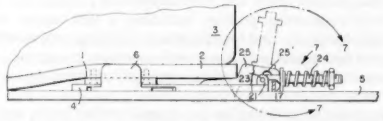
1. An adjustable collapsible cart, comprising:
an open topped box structure including a pair of opposite handed frames, each having a floor, a side wall and a front wall;
said frames having adjustable interconnecting means for varying the spacing between the side walls;
a wheel unit detachably secured to each frame;
each of said frames having a cavity for storage of the respective wheel unit;
handle means on at least one of said frames,
each of said floors is hollow with an upper panel and a lower panel;
and said interconnecting means including connecting bars slidably attached to said frames within the hollow floors.

3,884,492

OVERCENTER SKI BINDING MECHANISM

Richard G. Spademan, 933 Addison Ave., Palo Alto, Calif. 94301

Filed Mar. 15, 1973, Ser. No. 341,512
Int. Cl. A63c *9/08*
U.S. Cl. 280—11.35 R **9 Claims**



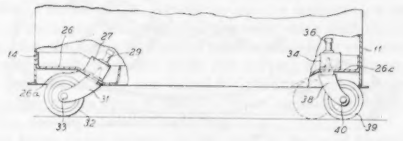
1. In a safety release binding having a first member with a first mating surface and means for fitting said first member to a ski;
a second member with a second mating surface for mating with said first mating surface and means for fitting said second member to a ski boot;
an overcenter mechanism including a spring retaining rod, a spring member connected to said rod and means for coupling said rod to one of said first and said second members such that said rod may translate longitudinally of the ski and rotate about a transverse axis, said rod having a first position parallel to said ski wherein said spring member biases said rod in a first direction for urging said mating surfaces of said first and said second members into releasable engagement and a second position angularly disposed from said first position wherein said spring bias is removed from said rod for separating said mating surfaces and disengaging said first and said second members, the improvement comprising: first means located on said rod and second means positioned adjacent said rod and spaced from said first means for contacting said first means and automatically rotating said rod about said transverse axis from said first position to said second position upon movement of said rod a predetermined distance in a second direction opposite to said first direction in response to the application of a predetermined force on said rod.

3,884,493

CASTER WHEELS FOR A PORTABLE APPLIANCE

Robert M. Weir, St. Joseph; Edward R. Fester, Coloma, and Gerrald K. Farrington, St. Joseph, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 23, 1973, Ser. No. 418,376
Int. Cl. B62b *1/12;* **B60b** *33/00*
U.S. Cl. 280—79.1 **6 Claims**



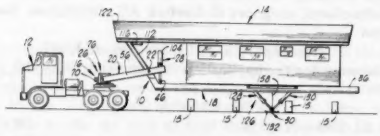
1. A portable appliance for dynamic operation comprising a four-sided frame,
a first pair of casters located at adjacent corners of said frame,
a second pair of casters located at the other corners of said frame,
means supporting said first pair of casters on the frame with their pintles substantially vertically disposed, and
means supporting said second pair of casters on the frame with their pintles at a substantial angle to both the vertical and horizontal directions whereby said first pair of casters is free to swivel about their respective pintles but said second pair of casters is substantially restrained from swiveling movement by the weight of said appliance and limits movement of the appliance during the dynamic operation thereof.

3,884,494

APPARATUS FOR TRANSPORTING HOUSE STRUCTURES OR THE LIKE

Harrell Dean Ashby, and Ivan V. Ashby, both of Rt. 2, Box 20A, Edmond, Okla. 73034

Filed Dec. 13, 1972, Ser. No. 314,806
Int. Cl. B60p *1/02*
U.S. Cl. 280—81 B **28 Claims**



1. Trailer apparatus, comprising:
support beam means having a forward end portion and a rearward end portion;
means connected to the forward end portion of the support beam means raising, lowering and supporting the forward end portion of the support beam means in predetermined positions thereof; and
rearward beam elevation means connected to the support beam means generally between the forward and the rear-

ward end portions thereof and having a portion engageable with the ground raising the rearward end portion of the support beam means in one position, and lowering the rearward end portion of the support beam means toward a ground engaging position in one other position, comprising: a ground engaging plate;

a pivot shaft secured to the ground engaging plate;

first hydraulic cylinder means comprising a pair of hydraulic cylinders, the bodies of said cylinders being rigidly interconnected having one end pivotally connected to the support beam means via a common pivot connection and the opposite end pivotally connected to the pivot shaft the first hydraulic cylinder means extending from the ground engaging plate in one direction; and

second hydraulic cylinder means comprising a second pair of hydraulic cylinders, the bodies of said cylinders being ridigly interconnected, having one end pivotally connected to the support beam means via a common pivot connection and the opposite end pivotally connected to the pivot shaft, the first hydraulic cylinder means and the second hydraulic cylinder means each being connected to the ground engaging plate via a common pivot connection provided via the pivot shaft the second hydraulic cylinder means extending in a generally opposite direction from the ground engaging plate with respect to the first hydraulic cylinder means, the first and the second hydraulic cylinder means moving the ground engaging plate in one direction lowering the rearward end portion of the support beam means in one condition of the first and the second hydraulic cylinder means and moving the ground engaging plate in an opposite direction raising the rearward end portion of the support beam means in an actuated position of the first and the second hydraulic cylinder means.

3,884,495
WALKER

Michael F. Petock, 420 Littlebrook Rd., Berwyn, Pa. 19312

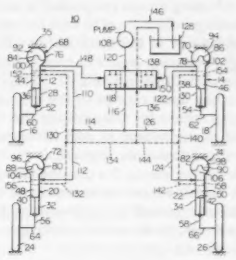
Filed July 1, 1974, Ser. No. 484,661
Int. Cl. B62b *11/00*
U.S. Cl. 280—87.02 W **14 Claims**

1. An apparatus for assisting a human being in learning to walk, comprising: a flexible seat, a plurality of upwardly extending members for supporting said seat, said plurality of members being supported on wheels for free movement, and a resilient material surrounding at least a part of each of said plurality of members extending at least from a point substantially adjacent said wheels to a point of a height substantially adjacent said flexible seat thereby minimizing the likelihood of damage to objects, in the environment in which the apparatus is used, by said plurality of members.

3,884,496
VEHICLE SUSPENSION SYSTEM

Naganori Ito, and Hiroshi Aikawa, both of Tokyo, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Apr. 8, 1974, Ser. No. 459,177
Claims priority, application Japan, Apr. 9, 1973, 48-39432
Int. Cl. B60g *21/06*
U.S. Cl. 280—124 F **8 Claims**

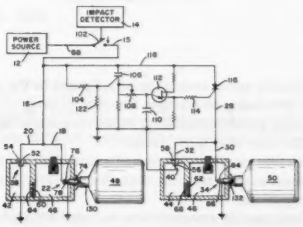


1. A suspension system of wheeled vehicle, comprising; a plurality of retractable and extensible suspension struts each having chamber of variable volume filled with pressurized fluid, said chambers of said plurality of struts being fluidly communicable with a pressurized fluid source to supply pressurized fluid into said chambers for extension of said plurality of struts; a plurality of level regulating means disposed between said chambers of said plurality of struts and said source and fluidly communicable with said source; and a control valve disposed between said plurality of level regulating means and said source to control fluid communication therebetween; said control valve being responsive to the difference between the pressures of the fluids in said chambers of two struts of said plurality of struts to block said fluid communication between said plurality of level regulating means and said source; each of said plurality of level regulating means, when said control valve unblocks said fluid communication between said plurality of level regulating means and said source, being able to control fluid communication between said chamber of the corresponding strut and said source.

3,884,497
INFLATION DIFFERENTIAL CONTROL FOR MULTIPLE BAG RESTRAINT SYSTEM

Roy H. Massengill, Brookside, and Ernest D. Buff, Bernardsville, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

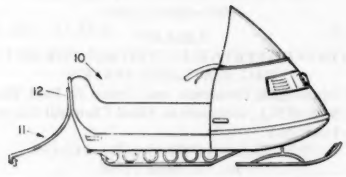
Filed Oct. 30, 1973, Ser. No. 411,139
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **17 Claims**



1. Multiple bag inflation apparatus adapted to be disposed in a vehicle subject to impact for inflating a plurality of bags, the time differential between inflation of the bags varying

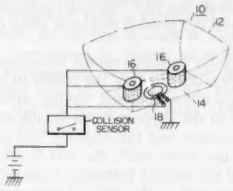
inversely with the impact velocity of the vehicle, comprising:
a. a power source for supplying an electrical current;
b. a first inflatable bag for protecting the legs of an occupant of said vehicle;
c. a second inflatable bag for protecting the torso of the occupant;
d. a first gas source for supplying inflating gas to said first inflatable bag;
e. a second gas source for supplying inflating gas to said second inflatable bag;
f. first gas releasing means connected to said first gas source for permitting inflating gas to flow into said first inflatable bag upon receipt of the electrical current;
g. second gas releasing means connected to said second gas source for permitting inflating gas to flow into said second inflatable bag upon receipt of the electrical current;
h. first circuit means for transmitting the electrical current from said power source to said first gas releasing means during a fixed first time interval;
i. impact detecting means for causing the current to pass to said first circuit means upon impact of the vehicle;
j. second circuit means for transmitting the current from said power source to said second gas releasing means during a second time interval;
k. control means associated with said second circuit means and being responsive to the impact velocity of the vehicle, for varying the second time interval in inverse proportion to the impact velocity.

3,884,498
SNOWMOBILE TRAIL SWEEP
Louis P. Cote, Jr., 13 Horizon Dr., Bedford, N.H. 03102
Filed May 7, 1973, Ser. No. 357,782
Int. Cl. B62m *27/02*
U.S. Cl. 280—150 R **3 Claims**



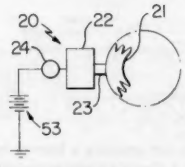
1. A flexible snow sweep for attachment to the rear of snow vehicles consisting of a single flap comprising:
a. a rising portion including means for securing said sweep to the rear of a snow vehicle;
b. a portion curving downwardly and rearwardly;
c. a terminating portion including means for securing a sweep blade;
d. a replaceable sweep blade secured to said terminating portion; and,
e. fastening means for fastening said terminating portion to said rising portion so as to roll up said sweep blade into an inoperative position.

3,884,499
DISCHARGE VALVE FOR VEHICLE SAFETY APPARATUS
Takashi Oka, Tokyo, and Kazuma Sato, Yokosuka, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan
Filed Oct. 16, 1973, Ser. No. 406,841
Claims priority, application Japan, Oct. 18, 1972, 47-104259
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **4 Claims**



1. A discharge valve for a safety apparatus for a vehicle, the safety apparatus having an inflatable confinement with a hole formed therethrough, a collision sensor operative to generate a collision signal in response to a collision of the vehicle, and a fluid producer operative to produce pressurized fluid to inflate the confinement in response to the collision signal, said discharge valve comprising:
a brittle plate sealing the hole and being strong enough to resist the pressure of the pressurized fluid produced by the fluid producer; and,
a plate breaker comprising a casing mounted adjacent to said brittle plate and an explosive and a projectile disposed inside said casing;
said explosive being ignitable by the collision signal;
said explosive and said projectile being mutually aligned within said casing substantially tangent to said brittle plate so that said explosive, when ignited, propels said projectile against said brittle plate to shatter the same and allow pressurized fluid to escape through the hole from the confinement.

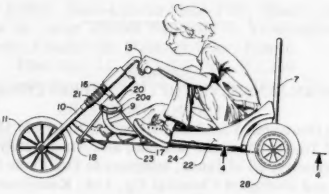
3,884,500
PRESSURE SENSING MEANS AND METHOD OF A PRESSURIZED CONTAINER MEANS AND SYSTEM UTILIZING THE SAME
Joseph P. Wagner, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.
Division of Ser. No. 322,071, Jan. 8, 1973, Pat. No. 3,818,764. This application Apr. 17, 1974, Ser. No. 461,515
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 AB **7 Claims**



1. In combination, a vehicular air-bag safety means adapted to be inflated upon the detection of vehicular impact, a container means having a pressurized fluid therein for inflating said air-bag safety means when fluidly interconnected thereto, fluid operated sensing means carried by said container means for sensing pressure changes within said container means, and detection means operatively associated with said sensing means to indicate when said sensing means is sensing a loss or

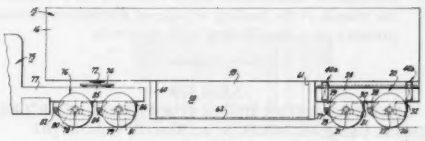
a gain of pressure in said container means beyond desired limits thereof, said sensing means and said container means being so constructed and arranged that said sensing means is temperature compensated by being substantially surrounded by a reference pressure of said fluid of said container means so that pressure changes of said fluid in said container means caused by temperature changes thereof are ineffective to cause sensing thereof by said sensing means as said fluid of said sensing means is at the same temperature as said fluid in said container means, said fluid operated sensing means and said container means having been initially charged with their respective pressurized fluids to substantially the same pressure levels.

3,884,501
FOOT-OPERATED JUVENILE VEHICLE
Jack J. Elias, and Joseph C. Tieri, both of Minneapolis, Minn., assignors to Leisure Dynamics, Inc., Minneapolis, Minn.
Filed Jan. 23, 1974, Ser. No. 435,710
Int. Cl. B62m *1/04*
U.S. Cl. 280—251 **4 Claims**



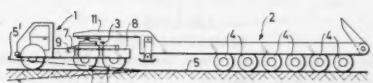
1. A foot-operated vehicle comprising:
a. a wheeled frame,
b. seat means carried by said frame,
c. a pair of rear wheels each rotatably mounted on said frame,
d. a pair of foot levers each pivotally mounted adjacent one of its ends upon said frame ahead of said seat means and constructed and arranged to be moved by the feet of a rider sitting upon said seat means from a rearward to a more forwardly extending position,
e. a pair of foot pedals each carried by the opposite end of one of said levers to facilitate such movement of said foot levers by such a rider,
f. a pair of rotary gear means each connected with one of said rear wheels in driving relation and mounted for rotation therewith upon said frame,
g. a pair of rotary drum means each associated with the gear means of one of said rear wheels and mounted for rotation upon said frame,
h. ratchet means extending in driving relation between each of said drum means and its associated rotary gear means,
i. cable means extending between each of said drum means and one of said foot levers and constructed and arranged to be moved with respect to its associated drum means between extended and retracted drum-encircling relation,
j. resilient means connected to each of said rotary drum means and constantly urging the same to rotate and draw its associated cable means to retracted drum-encircling relation and its associated foot lever to its rearwardmost position,
k. said ratchet means including a plurality of pawls pivotally mounted upon and within said drum means in position to engage said gear means and prevent rotation thereof in more than one direction, and
l. said pawls being of single-piece construction and including a spring arm extending outwardly therefrom and engaging against an interior surface of said drum means to hold said pawl in gear-engaging relation.

3,884,502
SEMITRAILER OR THE LIKE
Ray B. Wagner, 32783 Sumac St., Union City, Calif. 94587
Filed Dec. 17, 1973, Ser. No. 425,538
Int. Cl. B62d *53/06*
U.S. Cl. 280—423 R **11 Claims**



1. A semitrailer or the like, comprising:
a. frame structure defining a chassis equipped with load-carrying apparatus;
b. air suspension wheel assembly removably securable to said frame structure adjacent the rear end of said trailer;
c. fastener mechanism for releasably securing said wheel assembly to said frame structure, said fastener mechanism including a plurality of latch devices having cooperative components respectively provided by said frame structure and wheel assembly each of said latch devices being selectively movable between latch and release conditions, each of said latch devices providing an over-center action in which the device tends to maintain itself selectively in each of the latch and release conditions thereof, and in which each latch device is equipped with a releasable safety to constrain the device in the latch position thereof to prevent inadvertant movement of the device into its release condition;
d. support structure secured to and depending from said frame structure intermediate the ends thereof to support said trailer upon removal of said wheel assembly;
e. means for overpressurizing the air-suspension of said wheel assembly to enable said frame and support structures to be raised to an abnormal elevation for insertion of support blocks under the latter to engage the same and support said trailer upon subsequent reduction of pressure in the air suspension system to underpressurize the same and enable said wheel assembly to be removed from said frame structure upon release of said fastener mechanism;
f. and a king-pin carried by said trailer adjacent the front end portion thereof to enable the same to be releasably interconnected with the fifth-wheel assembly of a tractor.

3,884,503
DEVICE FOR THE INTERCONNECTION OF PULLING VEHICLES AND SEMITRAILER
Sverre Damm, Ant. Tschudisvei 25, Oslo 5, Norway
Filed Jan. 17, 1974, Ser. No. 434,195
Claims priority, application Norway, Jan. 24, 1973, 286/73
Int. Cl. B62d *53/06*
U.S. Cl. 280—440 **7 Claims**



1. An improved hitch for use between a frame section of a semi-trailer and a frame section of a hauling vehicle, the hitch comprising:
a frame pivotally mounted at one end thereof to one of the frame sections;

movable means connected between the frame and the other frame section for coupling the semi-trailer to the hauling vehicle; and

fluid powered means vertically movable and connected between the frame and the first mentioned frame section for maintaining a constant predetermined vertical force between the semi-trailer and the hauling vehicle during traversal of road inclines which results in the exertion, by the wheels of the hauling vehicle, of a relatively constant pressure on a road during such traversals.

3,884,504

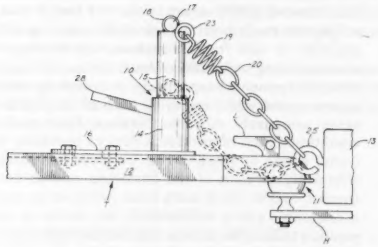
SLACK ADJUSTER HITCH FOR MOTOR VEHICLES

Eldo L. Campbell, 540 Fifth St., Bennett, Colo. 80102

Filed Sept. 20, 1973, Ser. No. 398,942

Int. Cl. B60d *1/12*

U.S. Cl. 280—446 R **7 Claims**



1. Stabilizer apparatus adapted for reducing slack between a towed vehicle and a towing vehicle comprising in combination:

a first coupling member extending forwardly from the towed vehicle and a second coupling member extending rearwardly from the towing vehicle for releasable interconnection with said first coupling member,

vertically adjustable lift jack means extending vertically from said first coupling member including control means to vertically adjust between a retracted and extended position,

a cross member connected to one end of said lift jack means opposite to its connection to said first coupling member and extending in a direction transversely of the length of said vehicles, said cross member having attaching means at opposite ends thereof; and

a pair of flexible connector means secured at their rearward ends to opposite ends of said cross member and at their forward ends to the towing vehicle in laterally spaced-apart relationship to one another whereby vertical extension of said lift jack means by said control means is operative to remove any slack in said flexible connector means and between said first and second coupling members.

3,884,505

MARKING FILM

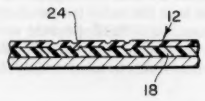
James A. Miller, Akron, Ohio, assignor to Morgan Adhesives Company, Stow, Ohio

Filed Apr. 23, 1973, Ser. No. 353,657

Int. Cl. B44f *1/00*

U.S. Cl. 282—27.5 **6 Claims**

1. A marking film comprising a two-ply flexible laminate layer of high density polyethylene each ply of which is oriented in one direction and where the directions of orientation are not in alignment in the laminated layer, said laminated layer being white and a backing layer on one face of said laminated layer and being of a color other than white whereby when localized forces are applied to said laminated layer it



becomes substantially clear and the backing material color can be seen therethrough.

3,884,506

PRESSURE-SENSITIVE COPYING PAPERS CONTAINING FLUORAN COMPOUNDS

Minoru Ozutsumi; Yoshihide Miyazawa; Katsuichi Motohashi, all of Tokyo; Masatake Kiritani, and Akio Watanabe, both of Fujumiya, all of Japan, assignors to Fuji Photo Film Co., Ltd. and Hodogaya Chemical Co., Ltd., Kanagama, both of Tokyo, Japan

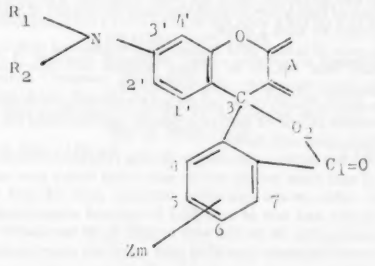
Filed Dec. 26, 1972, Ser. No. 318,048

Claims priority, application Japan, Dec. 24, 1971, 46-104645

Int. Cl. B41c *1/06;* **B41m** *5/00*

U.S. Cl. 282—27.5 **2 Claims**

1. A pressure-sensitive copying paper comprising on a support a layer of an encapsulated color former and on the same or a different support a layer of an electron accepting solid, said color former being a fluoran compound represented by the formula;



wherein R_1 represents a hydrogen atom or a lower alkyl group containing 1 to 4 carbon atoms; R_2 represents a lower alkyl group containing 1 to 4 carbon atoms; Z represents one or more of a hydrogen atom, chlorine atom or nitro group; *m* represents an integer of from 1 to 4 and

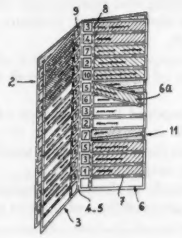
represents a naphthalene ring of the formula;

wherein one of X and Y represents a hydrogen atom and the other represents —N=CH—B group; one of X′ and Y′ represents a hydrogen atom and the other represents —N=CH—B group; wherein B represents a lower alkyl group containing 1 to 7 carbon atoms, propenyl, styryl, phenyl or naphthyl group, and where said phenyl or naphthyl group may be substituted with methyl, methoxy, hydroxy, dimethylamino, nitro group or chlorine atom.

3,884,507
MENU

Florence Fumel, Saint-Cyr-Au-Mont-d'Or, Rhone, France, assignor to Anvar Agence Nationale de Valorisation de la Recherche, Courbevoie, Hauts de Seine, France

Filed Dec. 21, 1972, Ser. No. 317,260
Claims priority, application France, Dec. 22, 1971, 71.46909
Int. Cl. B42d *15/02*
U.S. Cl. 283—60 **1 Claim**

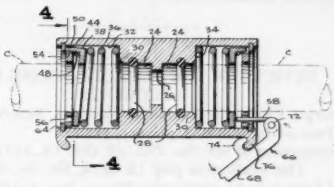


1. A menu comprising a pair of mutually attached coexentensive sheets including a top sheet overlying a bottom sheet; means subdividing said top sheet into a plurality of rectangular zones in a vertical row, said means facilitating separation of said zones from one another and from the balance of said top sheet by weakening the edges of said zones and permitting tearing along said edges; printed indicia representing items of fare on each of said zones; printed indicia in a column narrower than said row adjacent each of said zones on said top sheet and remaining upon the balance thereof upon removal of the associated zone to indicate a characteristic of the respective item of fare; means subdividing said bottom sheet into at least one row of zones coextensive and registering with respective zones of said top sheet but fixed together against separation whereby a zone of said bottom sheet is exposed upon removal of a zone of said top sheet from the balance thereof; and identical indicia in each of the zones of the bottom sheet to the indicia carried by the respective detachable zone of said top sheet, the indicia remaining on the balance of said top sheet being provided in a row of respective further zones, at least some of the zones of one of the rows being of one color and other zones of said one of said rows being of another color corresponding to a family of items indicated thereby, each of said sheets being folded down the center and said bottom sheet enclosing said top sheet in a closed position of the menu.

3,884,508
PIPE COUPLINGS

Eugene G. Jones, 2637 N. Johnson St., New Orleans, La. 70117

Filed Dec. 10, 1973, Ser. No. 424,347
Int. Cl. F16l *37/08*
U.S. Cl. 285—31 **17 Claims**



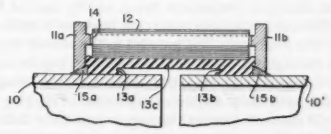
1. A releasable connector for pipes, tubes and like conduits comprising:

a. a housing having a central bore sized to receive said conduit,
   1. means positioned in said sized central bore for sealing said conduit to effect a watertight seal,
b. an enlarged bore positioned adjacent the mouth of said central bore,
c. a spring sized to fit within said enlarged bore and freely receive said conduit,
d. a locking ring biased against said spring to a canted position for grasping and holding the outer surface of said conduit,
e. canting means on the opposite side of said ring for canting said locking ring to hold said conduit in position,
f. abutment means at one end of said enlarged bore to limit movement of said canting means,
g. support means on the exterior of said housing to position a release pin for contact with said locking ring and to permit axial alignment of said locking ring with said conduit for release of said conduit,
h. release pin actuating means pivotally and releasably connectable to said support means, and
i. a release pin pivotally connected to said release pin actuating means to effect release of said conduit by substantially axial movement of said release pin.

3,884,509
PIPE COUPLING DEVICES

Richard O. Marsh, Jr., 701 Standard Life Bldg., Pittsburgh, Pa. 15222

Continuation-in-part of Ser. No. 163,911, July 19, 1971. This application Nov. 16, 1973, Ser. No. 416,583
Int. Cl. F16l *17/00*
U.S. Cl. 285—37 **18 Claims**



1. A pipe coupling device for coupling two coaxially juxtaposed pipe sections, comprising an annular housing for surrounding the juxtaposed ends of the pipe sections, a pair of coaxially spaced gasket ring seals contained in said housing for respectively surrounding a corresponding one of said pipe sections, and preformed metal spiral band means for exerting a compression force on said gasket ring seals variable according to the number of turns of said band means introduced into said housing in surrounding relation to said seals, and means

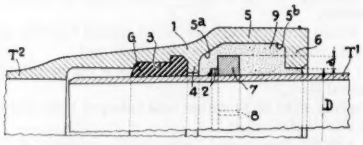
associating said band means and said housing whereby rotation of said housing in one direction varies the number of turns of the spiral band means within the housing effective to compress both said ring seals, said pair of coaxially spaced gasket ring seals being joined integrally by a connecting bridge portion and said spiral band means being coextensive with said bridge portion and exerting a compression force on both said ring seals simultaneously.

3,884,510

DEVICE FOR THE TENSILE LOCKING OF PIPE ELEMENTS

Georges Eugène Bram, Pont-a-Mousson, France, assignor to Pont-a-Mousson S. A., Nancy, France

Continuation of Ser. No. 298,749, Oct. 18, 1972, abandoned. This application July 22, 1974, Ser. No. 490,601
Claims priority, application France, Nov. 4, 1971, 71.39488
Int. Cl. F16l *13/10*
U.S. Cl. 285—39 **3 Claims**



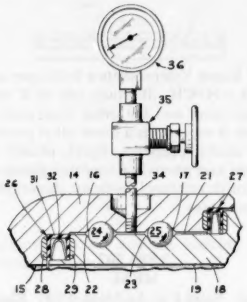
1. A device for axially locking a joint between two pipe elements whose axes may have an angular deviation so as to preclude axial separation of the pipe elements, the device comprising an annular abutment projection integral with an outer surface of an end portion of a first of said pipe elements and spaced from one end thereof, a hollow member of revolution integral with an end portion of a second of said pipe elements and having an inwardly intending annular first shoulder, an inner annular recess and an annular second shoulder, which defines an axially outer end of the inner recess and also defines an entrance to said recess, a ring located axially between the second shoulder and the abutment projection and bearing axially against the abutment projection and defining an annular axial space with the second shoulder said ring having an outer diameter greater than the outer diameter of said abutment projection and the inner diameter of said second shoulder, said inner recess being in radially spaced relation to said outer surface and to the ring and said entrance having a diameter less than the outer diameter of said ring, said inner recess having an axial extent and an inside diameter which are such as to allow up to a given angular deviation between the axes of the two pipe elements without contact of said ring with said inner recess and second shoulder, said ring and said abutment projection being axially spaced from said first and second shoulders, said ring being of a resilient material and has a split which is parallel to the axis of the ring and extends throughout the axial length of the ring for receiving a tool for expanding the ring, the inside diameter of said recess being such as to allow sufficient expansion of the ring disposed inside said recess to permit the ring to pass over the abutment projection when inserting the first pipe element in the hollow member of revolution, and a hardened mass of initially moldable filler material disposed in the whole of said annular space and interposed between said inner recess and the ring and said outer surface, said inner recess, outer surface, first and second shoulders, abutment projection, and ring being in intimate contact with said filler material in the manner of a mold for said filler material, said material having such strength and such resistance to deformation as to be capable of withstanding force normally to be expected to be exerted on said material by said ring and second shoulder in pipe service.

3,884,511

NITROGEN CHARGED SWIVEL JOINT

Dean E. Hermanson, Richardson, Tex., assignor to Youngstown Sheet and Tube Co., Youngstown, Ohio

Filed Aug. 10, 1972, Ser. No. 279,522
Int. Cl. F16l *35/00*
U.S. Cl. 285—93 **5 Claims**



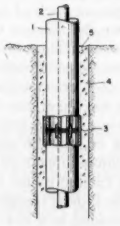
1. A swivel joint comprising,
a body having a flow way therethrough,
bearing race means in the wall of the body providing said flow way,
a nipple having a flow way therethrough,
bearing race means in the outer periphery of said nipple,
bearings in said bearing race means,
seal means straddling said bearing race means,
and an inert gas under positive pressure in the space between said seals,
the seal means exposed to the exterior of said swivel joint preventing loss of said inert gas from between said seal means,
the seal means exposed to the interior of said swivel joint preventing flow in either direction to contain said inert gas and prevent flow of fluid from said flow way into the space between said seals,
said body and nipple in the area between said seal means impervious to prevent flow of fluid to or from said area.

3,884,512

DEEP-WELL DRILLING ARRANGEMENT

Ludwig Wesch, Heidelberg, Germany, assignor to Mancar Trust, Vaduz, Liechtenstein

Continuation of Ser. No. 147,264, May 26, 1971, abandoned. This application Aug. 27, 1973, Ser. No. 391,557
Int. Cl. F16l *47/00*
U.S. Cl. 285—133 R **19 Claims**



1. A deep-well drilling arrangement, wherein an outer and inner pipe string are coaxially arranged in a bore hole, the improvement comprising,
a first plurality of axially and peripherally fiber glass reinforced pipe sections coaxially positively coupled to each

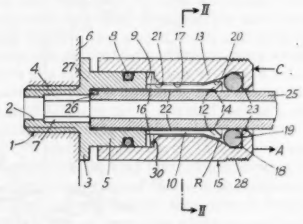
other by first coupling means as to form said outer pipe string,

a second plurality of axially and peripherally fiber glass reinforced pipe section positively coupled to each other by second coupling means forming said inner pipe string, a longitudinal fiber layer extending around the entire periphery of each pipe section and coupling means and connected to the pipe section and coupling means of which each pipe string is constituted, said longitudinal fiber layer acting as axial reinforcements for the respective entire pipe string, the ratio between the axial expansion of each of the pipe strings and the radial expansion thereof being less than 0.95.

3,884,513
COUPLING FOR A PIPE OR TUBE

Willy Gassert, Solothurn, Switzerland, assignor to Societe Legris France, S.A., Ozoir-la-Feffiere, France

Filed Jan. 17, 1974, Ser. No. 434,273
Claims priority, application Switzerland, Jan. 31, 1973, 1350/73
Int. Cl. F16l *21/06*
U.S. Cl. 285—322 **10 Claims**



1. A coupling for a pipe or tube comprising a first member having an axial passage therethrough, a second member slidably disposed over the first member and having an axial passage therethrough, circumferentially spaced flexible clamping jaws disposed around the wall of the passage of the second member and secured at one end to said first member and terminating in opposite free ends, said clamping jaws being so disposed that said slidable member presses the free ends thereof radially inwardly when moved to its extreme position over the first member and releases the clamping jaws to permit radial expansion thereof when disposed away from the said extreme position.

3,884,514
DOOR LATCH MECHANISM

George J. Praska, Crystal, Minn., assignor to Wright Products, Inc., St. Paul, Minn.

Filed Nov. 30, 1973, Ser. No. 420,634
Int. Cl. E05c *7/04*
U.S. Cl. 292—11 **10 Claims**

1. In a door latch, the combination comprising:

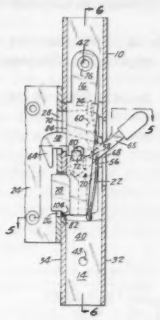
a housing,

a latch member having a latch hook and a handle, said member being rotatably mounted about a fixed transverse axis for movement of said hook back and forth from an extended position for engaging a keeper to a retracted position within said housing,

a bolt member mounted in said housing for movement back and forth from an extended position within said keeper to a retracted position within said housing,

a cam fixed in relation to said latch member and rotatable therewith, and

a follower carried by said bolt member and engaged by said cam to move said bolt to the retracted and extended

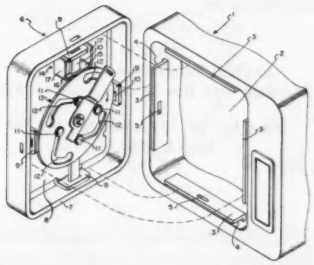


position corresponding with that assumed by said latch hook upon movement of said handle.

3,884,515
VAULT DOOR

Ellis Ashkenazi, Rego Park, N.Y., assignor to GET Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 10, 1973, Ser. No. 423,041
Int. Cl. E05c *9/06*
U.S. Cl. 292—34 **4 Claims**



1. An improved door for use with a housing including an opening, a plurality of tongues extending from said housing into said opening forming a groove between said housing and said tongues, said door including a rim around the outer edge thereof, said rim being adapted to fit into said groove, said door further including a plurality of locking bars operatively mounted thereon and selectively engagable with said tongues to lock said door into place on said housing, the improvement comprising an anti-jamming bracket slideably connected to one of said bars, said bracket including an arm extending outward in the direction of the free end of said bar whereby when said door is incorrectly positioned for installation into said opening, said bracket slides down said bar so that upon attempted installation of said door into said opening said bracket strikes the tongue in the area of the opening adjacent thereto and prevents complete installation of said door into said opening.

3,884,516

MOTOR VEHICLE WITH IMPACT-DAMPING BUMPER

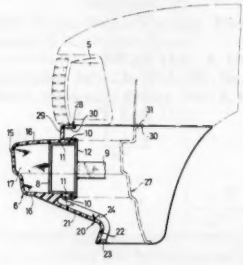
Georg A. Gallion, Wiesbaden; Klaus Weichsler, Florsheim; Horst Hullmann, Wicker, and Horst Munzer, Russelsheim, all of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed May 20, 1974, Ser. No. 471,596

Claims priority, application Germany, June 15, 1973, 2330494

Int. Cl. B60r *19/08*

U.S. Cl. 293—69 6 Claims



1. In a motor vehicle, a bumper comprising a rigid supporting member extending in a direction generally transversely of the vehicle, a resilient member which has a high impact-damping capacity and extends substantially the whole length of the support member, the resilient member forming with the support member a cross-sectional shape approximating to a closed rectangle, means securing the resilient member to the support member along the length thereof, and a spoiler — for increasing the dynamic wheel pressure of the vehicle — integrally connected to the resilient member to form a one-piece construction therewith and extending obliquely downwardly from a location at the under side of the resilient member close to said securing means.

3,884,517

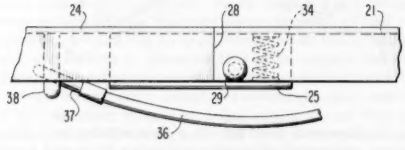
SAFETY BUMPER FOR TRUCKS

Spydell Davidson, P.O. Box 145, Highway 45, Martin, Tenn. 38237

Filed July 25, 1973, Ser. No. 382,357

Int. Cl. B60r *19/04*

U.S. Cl. 293—76 4 Claims



1. In a vehicle having front steering wheels and a front bumper in advance of the front steering wheels including bumper end portions which extend across the wheel treads in spaced relation thereto, the improvement comprising means forming a connection between the bumper end portions and a central body portion of the bumper, said means constructed and arranged to fail mechanically when an end portion of the bumper receives an impact force in excess of a predetermined degree which the bumper end portion can withstand without causing failure of said means, the failure of said means producing separation of the bumper end portion bodily from said central body portion, said means including a shear pin connecting each bumper end portion to the central body portion, and resilient means connected with each bumper end portion whose energy is released on failure of the shear pin to force clean separation of the bumper end portion from said body portion.

3,884,518

CASTING-OFF DEVICE

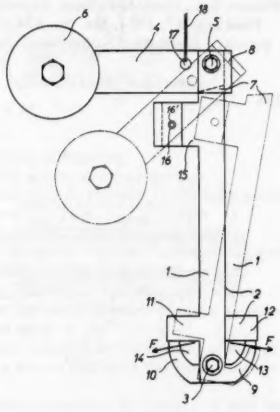
Marcel Lepetit; Christian Charles, both of Brest; Jean Nonnet, Guilers, and Francois LeFoll, Brest, all of France, assignors to Le Nickel and Centre National pour l'Exploitation des Oceans, both of Paris, France

Filed July 17, 1973, Ser. No. 379,939

Claims priority, application France, July 19, 1972, 72.26060

Int. Cl. B66c *1/38*

U.S. Cl. 294—83 R 5 Claims



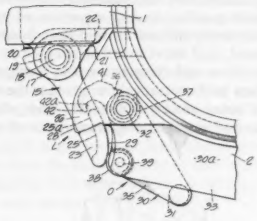
1. A casting-off device of the kind comprising two arms which are pivoted together to be displaceable between a closed position in which they are disposed substantially one behind the other and an open position, and which arms are so shaped as to form, near their pivot point, at least one casting-off hook or eye which is open when said arms are in the open position and closed when these arms are in the closed position, characterized in that:

a transverse member which is effectively weighted at its one end is pivotally mounted at a point near its other end on one of said arms, the transverse member being displaceable between a locking position in which it is at approximately right-angles to said arms and a release position in which it is inclined from said pivot point; a stop is provided at said other end of said transverse member; a retaining element to coact with said stop is provided at the end of the other of said arms, said retaining element engaging said stop when the transverse member is in the locking position and releasing said stop when the transverse member is in the release position; means for connecting at least one float to said transverse member are located on the transverse member between its weighted end and said pivot point; the pivot point of said arms is disposed near that end of each of said arms that is remote from said transverse member, the arms being so formed as to constitute, near the pivot point, two symmetrical casting-off hooks which are either completely closed or open at the side, depending upon whether the arms are in the closed or open position; and, for the purpose of locking said pivoted arms in the closed position by means of a water-soluble peg, holes are formed in the arms to be in register when the arms are in the closed position.

3,884,519
SAFETY LATCH FOR WELL PIPE ELEVATORS

Edward Joseph McFadden, Houston, Tex., assignor to Byron Jackson Inc., Long Beach, Calif.

Filed Aug. 30, 1973, Ser. No. 393,085
Int. Cl. E21b *19/06*; **B66c** *1/10*
U.S. Cl. 294—90 **8 Claims**

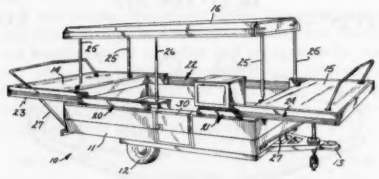


1. A well pipe elevator comprising: an arcuate body having means engageable by elevator links for supporting the elevator in the hoist apparatus of a derrick, a side door pivotally mounted on said body and forming a circular structure for surrounding a well pipe upon closure of the door, latch means for releasably holding said door closed, said latch means including a latch arm pivoted on said body, spring means biasing said latch arm in a latching direction, and latch arm engaging means on said door, latch operating means on said door for actuating said latch arm to a released position, said latch operating means including a unitary lever pivotally mounted on said door, an operating handle on said lever at one side of the pivotal mounting for said lever, latch locking means on said lever at the other side of the pivotal mounting for said lever, said latch locking means including a hook-like end section on said lever and providing a locking surface disposed within the curve of said hook-like end section adjacent to the free end thereof, said latch arm having a portion adapted to be opposed by said locking surface, and spring means biasing said lever to a position at which said locking surface is opposed to said portion of said latch arm.

3,884,520
DRIVE MECHANISM FOR COLLAPSIBLE CAMPING VEHICLES

Wilbur E. Peterson, Harmony, Minn., assignor to Harmony Enterprises, Inc., Harmony, Minn.

Filed Sept. 25, 1973, Ser. No. 400,624
Int. Cl. B60p *3/34*
U.S. Cl. 296—27 **4 Claims**

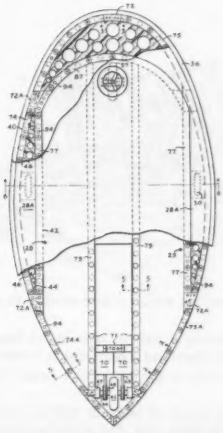


1. A drive mechanism for erecting the roof of a collapsible structure between collapsed and service positions, comprising:
a. a plurality of elongated rails constructed for mounting in a generally horizontal orientation on a base;
b. oppositely extendable members mated with said rails for allowing limited relative horizontal movement between said rails and said extendable members while preventing relative vertical movement;
c. a roof member;
d. a plurality of elongated rods pivotally connected to said roof member and said oppositely extendable members so as to move said roof member into an elevated service position upon outward movement of said oppositely extendable members;
e. a common drive pinion rotatably positioned within one of said rails and engaging racks on said oppositely extendable members for causing simultaneous movement thereof in opposite directions; and
f. a pair of shafts mounted between said elongated rails generally perpendicular thereto, each of said shafts having a pinion at each end drivably engaging racks attached to said oppositely extendable members, whereby the motion applied by said common drive pinion to said oppositely extendable members along one rail is transferred by said rods to the oppositely extendable members along the other rails.

3,884,521
LIGHT-WEIGHT, DURABLE, LAND-TRAVERSING VEHICLE

Alvin Edward Moore, Manini Way, Diamondhead, Rt. 1, Bay, St. Louis, Miss. 39520

Filed Sept. 24, 1973, Ser. No. 399,951
Int. Cl. B62d *21/00*, *29/04*
U.S. Cl. 296—31 P **26 Claims**



1. A vehicle adapted to traverse land, including:
floor structure, having load-containing space above it;
sidewall framework, connected to said floor structure, comprising: a plurality of sidewall beams of vehicle-strength-providing material, including pairs of spaced-apart, oppositely-positioned beams, each pair having spaced-apart, opposite surfaces of the two beams and opposite holes that extend into said material from said surfaces, each of said holes at one of the surfaces of the two beams opening toward and aligned with a similar, opposite hole in the other of said two beams;
hollow members of vehicle-strength-providing material, connecting and bracing said opposite beams, each of said hollow members having ends extending into and braced in an aligned pair of said opposite holes; and securing means, holding said ends in said holes and said hollow membes in vehicle-strength-providing assembled relation;
lower land-traversing structure, fixed to said floor structure, comprising: a plurality of lower-structure beams of vehicle-strength-providing material, including pairs of opposite, spaced-apart, lower-structure beams having a plurality of opposite holes that extend into said material

from opposite-beam surfaces of each pair of said lower-structure beams, each of said last-named opposite holes at one of said opposite-beam surfaces opening toward and aligned with a hole in the other of said opposite-beam surfaces; lower-structure hollow members of vehicle-strength-providing material, connecting and bracing said opposite lower-structure beams, each of said lower-structure hollow members having ends extending into an aligned pair of said last-named opposite holes; securing means holding said ends of the lower-structure hollow members in said last-named holes and in vehicle-strength-providing assembled relation; and means for facilitating overland travel, supported by some of said beams;

waterproof, vehicle-strength-providing, exterior skin means, connected to outer portions of said sidewall framework and said lower structure; and

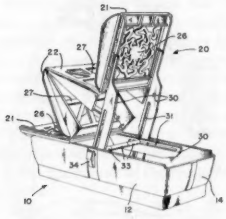
vehicle-strength-providing, interior skin means, connected to inner portions of said sidewall framework.

3,884,522

CONVERTIBLE SLEEPER SEATS FOR PLEASURE BOATS

Juichi Arima, and Delbert L. Brink, both of Seattle, Wash., assignors to Tempress, Inc., Seattle, Wash.

Filed Oct. 29, 1973, Ser. No. 410,347
Int. Cl. B60n *1/10*
U.S. Cl. 297—63 **8 Claims**



1. A seat assembly which is convertible to a bed, comprising:

a seat unit having a pair of seat backs hinged together at their upper edges and a pair of seat bottoms, each hinged at its rear edge to the respective lower edges of the seat backs,

a base having a pair of laterally spaced, upended, parallel, opposed sidewalls and end walls terminating in a common, planar upper edge, the seat unit slidably supported on the upper edge of the laterally spaced sidewalls for movement between a raised position wherein the seat units form back-to-back seats and a lowered position wherein the seat units flatten out to form a bed supported on the upper edge of the laterally spaced walls,

securing means slidably securing the seat unit to the base, and

locking means frictionally clamping the sidewalls of the base to the securing means to retain the seat unit in a predetermined position.

3,884,523

PROTECTIVE COVERING FOR A VEHICLE

Brian S. Allen, P.O. Box 611, Ironton, Ohio 45638

Filed Jan. 21, 1974, Ser. No. 434,971
Int. Cl. B60j *7/20*
U.S. Cl. 296—136 **3 Claims**

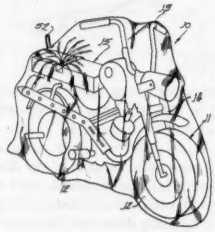
1. A protective covering for a motorcycle vehicle comprising:

a seat adapted to be mounted in the conventional position on the motorcycle;

a hollow storage compartment defined within said seat;

means providing access to said storage compartment for selectively opening and closing the same, said seat being defined by an elongated hollow, box-like rectangular configuration having a top surface, a bottom surface, opposed sidewall and endwall surfaces, said surfaces defining the storage compartment, said means providing access to said storage compartment and comprising a slot extending transversely through said top surface;

a flexible sheet member having a portion of its peripheral edge permanently affixed to said seat inwardly of said compartment, said sheet member adapted to be partially withdrawn from said compartment in a manner to completely cover said motorcycle to protect the motorcycle, said sheet being readily collapsible and adapted to be folded into said storage compartment for storage therein



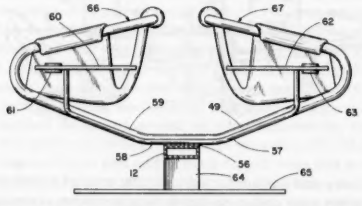
between use, the peripheral edges of said sheet material being permanently affixed to said seat inwardly of said storage compartment about said access slot, said access slot being recessed inwardly of said seat top surface with the means closing said access slot being in the form of an elongated closure member affixed to the opposite sides of said slot and operable in a manner to open and close said slot and wherein said means affixed to said sheet of material for assistance in deploying the same comprises a handle-shaped pull tab affixed to said sheet of material and adapted to be disposed inwardly of said storage compartment once said cover is folded thereinto whereby upon opening said closure member the user may readily grasp the pull tab to withdraw said sheet of material through said slot in a manner to deploy the same over said motorcycle.

3,884,524

CANTILEVERED SEATING MEANS

Gunter F. Eberle, Dallas, Tex., assignor to The Vecta Group, Inc., Dallas, Tex.

Filed Jan. 28, 1974, Ser. No. 437,527
Int. Cl.[2] A47C *1/12*
U.S. Cl. 297—160 **5 Claims**



1. A forwardly cantilevered seating system which comprises a substantially horizontal base beam means;

a plurality of transverse floor runners below said base beam means and connected thereto;

a seat frame on said base beam means and comprising a pair of spaced legs extending upwardly and away from said

base beam means and a central bight portion joining said upwardly extending legs, defining seat back and arm supports, and projecting rearwardly from said legs;

attachment means securing said legs to said base beam means; and

seating web means suspended from said central bight portion of said seat frame and together with said seat frame forming a seat;

said floor runners extending transversely from the longitudinal axis of said base beam means for a distance sufficient to prevent tilting of the seating system when the seat is sat in,

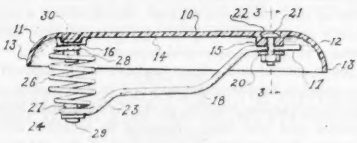
said seating web means being of a generally T-shaped configuration, and wherein extremities of said seating web means are removably secured to said seat frame by means of snap fasteners having mating parts and are wrapped around said seat frame at least about one-and-one-half turns so that the mating parts of said snap fasteners are urged against each other when a weight is carried by said seating web means.

3,884,525

BICYCLE SEAT STRUCTURE

Robert H. Mesinger, Lakecrest Dr., Aunt Hack Ridge, Danbury, Conn.

Filed Nov. 10, 1972, Ser. No. 305,372
Int. Cl. B62j 1/02
U.S. Cl. 297—212 **11 Claims**



1. A bicycle seat structure comprising:

a longitudinally extending base plate having a wide rearward portion and a narrow forward portion, the distance between the longitudinal ends of said portions defining an unstressed for and aft span;

a longitudinally extending undercarriage having a rear part and a front part;

rear means connecting said rearward portion to said rear part; and

front means connecting said forward portion to said front part;

one of said means enabling free relative longitudinal movement of the base plate and the undercarriage;

said base plate being substantially unstretchable and resiliently deformable to enable limited desired resilient flexing;

one of said means operatively connecting said base plate and undercarriage in a manner enabling free shortening and lengthening of said fore and aft span under loading and unloading forces, respectively, on the base plate produced by the rider of the bicycle, the base plate returning to its full length unstressed fore and aft span when unloaded when the rider dismounts.

3,884,526

UNIT FOR CONVERTING FLAT-BED TRUCKS TO SIDE-UMP TRUCKS

Phillip J. Sweet; Buck C. Hamlet, and David L. Sweet, all of Fresno, Calif., assignors to American Carrier Equipment, Fresno, Calif.

Filed July 2, 1973, Ser. No. 375,765
Int. Cl. B60p 1/16
U.S. Cl. 298—1 A **1 Claim**

1. A side-dump unit for converting a flat-bed truck to a side-dump truck, comprising:

A. a rectangular frame of substantially planar configuration having a length and a width substantially equal to the length and the width of a flat-bed mounted on the chassis of a selected flat-bed truck and adapted to be received upon the uppermost planar surface of the flat-bed, including,

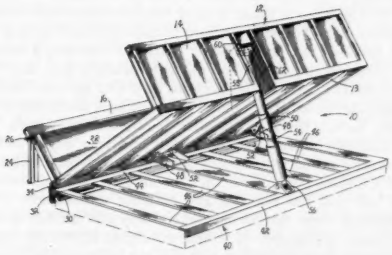
1. a pair of stringers disposed in mutual parallelism having a length substantially equal to the length of said flat-bed and spaced apart a distance substantially equal to the width thereof, and

2. a plurality of transverse members extended in mutual parallelism between said stringers and connected thereto;

B. a side-dump box having a length and a width substantially equal to the length and the width of said frame seated on said frame in a superimposed relationship therewith, including,

1. a pair of side walls having a length substantially equal to the length of said frame and disposed in planes arranged in mutual parallelism and spaced apart a distance substantially equal to the width of said frame, and

2. a pair of transversely oriented end walls extended in mutual parallelism between said side walls and connected thereto;



C. means defining in one side wall of said pair a normally closed, discharge opening for said side-dump box;

D. means including an enclosure member having a substantially U-shaped cross-sectional configuration defining within the other side wall of said pair of side walls a recess extended inwardly and opened outwardly with respect to said side-dump box;

E. hinge means adjacently related to said one side wall and affixed to said frame in juxtaposition with one stringer of said pair for pivotally connecting said side-dump box to said frame for oscillation about an axis extended in substantially juxtaposed parallelism with said one stringer;

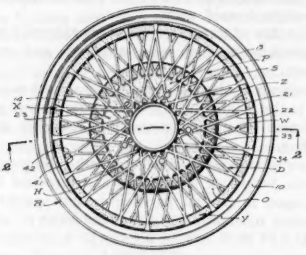
F. means including a pressure-responsive ram positioned above the plane of said frame for imparting oscillatory motion to said side-dump box including a base end disposed adjacent to said frame and a distal end disposed within said recess; and

G. mounting means for pivotally interconnecting said ram between said frame and said side-dump box including a bracket pivotally connected to the base end of said ram and affixed to the frame above the plane thereof in juxtaposition with the other stringer of said pair, and coupling means disposed within said recess for pivotally connecting the distal end of said ram to said enclosure member.

3,884,527
CAST SPOKE WHEEL

Henry James Clary, 17825 S. Santa Fe Ave., Compton, Calif. 90221

Filed Feb. 4, 1974, Ser. No. 439,577
Int. Cl. B60b *1/08*
U.S. Cl. 301—65 **10 Claims**



1. A unitary cast metal wheel comprising a central, axially extending cylindrical sleeve with axially disposed front and rear ends and a substantially flat flange with a cylindrical outer edge extending radially from the sleeve and defining a hub portion of the wheel, an annular rim portion with a radially inwardly disposed inner edge concentric with and surrounding the hub portion in radial spaced relationship and an annular, radially extending intermediate portion between the hub and rim portions, said intermediate portion comprising a plurality of circumferentially spaced elongate primary bars extending between the hub and rim portions on chord axes and defining an annular series of air conducting openings, said primary bars being substantially rectangular in cross-section with thin, substantially axially disposed front and rear edges and flat sides, said primary bars being of limited cross-sectional extent and affording limited structural stability and strength between the hub and rim portions and defining substantially axially extending stress rise corners where they join the hub and rim portions, a plurality of elongate, circumferentially spaced secondary bars extending between the hub and rim portions and arranged to extend circumferentially and radially across said openings on chord axes angularly related to the axes of adjacent primary bars and substantially intersecting at least one of the stress rise corners established by related primary bars to gusset said corners and to conduct resolved forces at said corners substantially longitudinally of said secondary bars between the hub and rim portions, said secondary bars being substantially rectangular in cross-section with thin, substantially axially disposed front and rear edges and flat sides, the cross-sectional extent of the secondary bars being limited to impart sufficient added strength to the wheel whereby the cumulative strength afforded by the primary and secondary bars affords desired strength to the intermediate portion and between the hub and rim portions of the wheel.

3,884,528
UNLOADING APPARATUS

Roland E. Shaddock, Streator, Ill., assignor to Myers-Sherman Company, Streator, Ill.

Filed Mar. 8, 1973, Ser. No. 339,060
Int. Cl. B65g *53/54*
U.S. Cl. 302—58 **12 Claims**

1. A pneumatic unloading apparatus for granular material comprising:

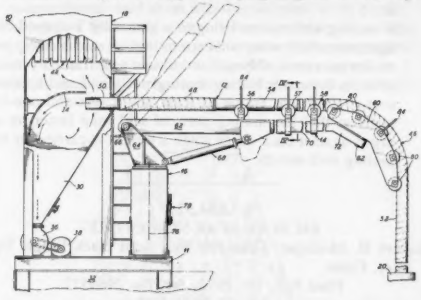
a material receiving compartment having a common air and material inlet and having separate air and material outlets;

a flexible hose means having a first end connected to said common air and material inlet and having a second end in operable communication with a lading of granular material;

means for inducing a suitable air flow into said flexible hose means second end through said hose and into said compartment, whereby granular material is drawn into the hose and conveyed to the material receiving compartment by the air flow;

separating means within said compartment to separate the granular material from the air flow;

a telescoping extensible support means for said flexible hose means arranged to support varying lengths thereof adjacent said first end in a generally horizontal position and with varying lengths of said hose means adjacent to said second end depending vertically downward from a free end of said extensible support means, about a supported bend, and terminating in said second end; said hose means supported atop said support means; and

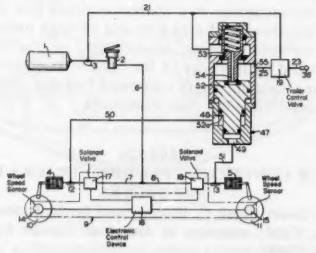


means to extend and retract said extensible support means to position said hose second end in a desired conveying position varying lengths of the flexible hose being supported and said bend changing its location along said flexible hose means as a function of the extension and retraction of the support means.

3,884,529
TRAILER BRAKE CYLINDER PRESSURE VARIED IN ACCORDANCE WITH VARIATIONS OF TRACTOR BRAKE CYLINDER PRESSURE IN RESPONSE TO TRACTOR WHEEL SLIP

Wilhelm Schlamann, Altwarmbuchen, and Herbert Merz, Hannover, both of Germany, assignors to Westinghouse Bremsen-und Apparatebau GmbH, Hannover, Germany

Filed July 30, 1973, Ser. No. 383,995
Claims priority, application Germany, Aug. 24, 1972, 2241704
Int. Cl. B60t *13/10, 13/66*
U.S. Cl. 303—7 **3 Claims**



1. A fluid pressure brake control apparatus for a wheeled tractor and trailer including at least one brake cylinder for the front wheels of the tractor, at least one brake cylinder for the

rear wheels of the tractor and at least one brake cylinder for the trailer, said apparatus comprising:

a. a manually operable means mounted on the tractor for controlling the supply and release of fluid under pressure to and from the brake cylinders on the tractor, wherein the improvement comprises:

b. a trailer control valve device operable to control the pressure in said at least one brake cylinder on the trailer,

c. valve means enabling operation of said trailer control valve device in accordance with the sum of the pressure in said at least one tractor front wheel brake cylinder and said at least one tractor rear wheel brake cylinder while said pressures act in the same direction on said valve means,

d. electro-responsive brake cylinder pressure controlling means for each of said tractor brake cylinders, each operable after a brake application has been effected to reduce the degree of pressure in the corresponding tractor brake cylinder, the reduction of pressure in at least one of said tractor brake cylinders being effective to cause said valve means to effect operation of said trailer control valve device to correspondingly reduce the degree of pressure in said at least one trailer brake cylinder, and

e. electrical means carried by each wheel of the tractor and operatively responsive to the rate of change of rotational speed of the respective tractor wheel to effect operation of the corresponding electro-responsive brake cylinder pressure controlling means whereby the pressure in said at least one trailer brake cylinder is substantially simultaneously controlled in accordance with the sum of the pressures in said tractor brake cylinders.

3,884,530

APPARATUS FOR REGULATING THE CONTROL CURRENT TO THE ELECTRIC BRAKE SYSTEM OF A TRAILER

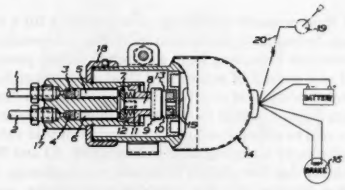
Rune Nilsson, Lindesberg, Sweden, assignor to AB Linde International, Lindesberg, Sweden

Filed Oct. 10, 1973, Ser. No. 405,181

Claims priority, application Sweden, Oct. 12, 1972, 13142/72

Int. Cl. B60t *7/20*

U.S. Cl. 303—7 **3 Claims**



1. An apparatus for regulating the control current from the brake system of a tractor to the electric brake system of a trailer, said apparatus comprising a brake regulator connectible to the brake system of the tractor and having at least one piston, membrane, or similar device operable by the braking medium of the tractor brake system, said piston, membrane, or similar device, when displaced by the braking medium against the action of a spring, being adapted to produce minute incremental variations of the current in an electronic circuit converted into continuous variations of the voltage in the control circuit of the electric brake system of the trailer, so that a substantially continuous voltage is emitted from the control circuit in proportion to the braking of the tractor, wherein the piston, membrane, or similar device is associated with a movable portion which is adapted to actuate, across an air gap, a member which is fixedly attached to the electronic circuit, the variation of the width of said air gap varying the inductance in said electronic circuit.

3,884,531

DEVICE FOR CONTROLLING THE BRAKING FLUID PRESSURE IN THE HYDRAULIC BRAKE SYSTEM OF MOTOR VEHICLES

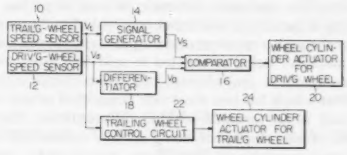
Yasuhisa Takeuchi, and Haruhiko Iizuka, both of Yokosuka, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Nov. 15, 1973, Ser. No. 416,065

Claims priority, application Japan, Nov. 20, 1972, 47-115671

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 BE **1 Claim**



1. A device for controlling the brake pressure on a road wheel of a motor vehicle, comprising first sensing means for producing an output voltage substantially proportional to the circumferential speed of rotation of a trailing wheel of the vehicle, second sensing means for producing an output voltage substantially proportional to the circumferential speed of rotation of a driving wheel of the vehicle, a signal generator for producing from an output voltage received from said first sensing means at an input terminal thereof, a signal voltage which is (1) equal to the output voltage of the first sensing means when the output voltage of the first sensing means is decreasing at a rate lower than a predetermined value, (2) decreased at a constant rate when the output voltage from said first sensing means is decreasing at a rate higher than said predetermined value or the output voltage of the first sensing means is increasing and lower than the signal voltage from the signal generator, and (3) increased substantially at the same rate as the output voltage from the first sensing means when the output voltage of the first sensing means is higher than the signal voltage from the signal generator, a differentiator for differentiating with respect to time the output voltage received from the second sensing means, at input terminal thereof, and producing a signal voltage which is representative of the rate of acceleration of the driving wheel, a comparator receiving the signal voltages from said signal generator and said differentiator and the output voltage from said second sensing means at first, second and third input terminals thereof, for producing a reference voltage which is equal to the difference between a predetermined proportion of said signal voltage from the signal generator and a predetermined constant voltage and for comparing the reference voltage with the sum of the output voltage from the second sensing means and a voltage proportional to the signal voltage from the differentiator and producing a first control signal, at an output terminal thereof, when the reference voltage is higher than said sum and a second control signal at the output terminal thereof, when the reference voltage is lower than said sum, and an actuator for the wheel cylinder of the driving wheel, the actuator being operative to cause the wheel cylinder to reduce the braking pressure on the driving wheel when supplied with said first control signal and to increase the braking pressure on the driving wheel when supplied with said second control signal, and wherein said signal generator comprises an operational amplifier, having its input terminal connected through a resistor to said input terminal of said signal generator, a converter having first to fourth diodes, the first and second diodes have respective cathode terminals which are

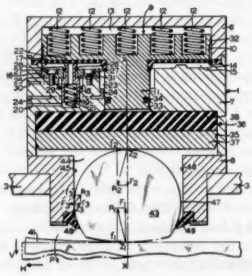
connected to each other while the third and fourth diodes have respective anode terminals which are connected to each other, the anode terminal of the first diode and the cathode terminal of the third diode being connected to the output terminal of said operational amplifier, the cathode terminals of the first and second diodes, respectively, being connected across a resistor to a terminal of a source of negative constant voltage $-e_1$, the anode terminals of the third and fourth diodes, respectively, being connected through a resistor to a terminal of a source of positive constant voltage e_2, and the anode terminal of the second diode and the cathode terminal of the fourth diode being connected to an output terminal of said converter, the output terminal of said converter being connected to an input terminal of an integrator, said integrator consisting of an operational amplifier and a capacitor which are connected in parallel to the output terminal of said converter through a resistor, the output terminal of the operational amplifier and one electrode of said capacitor being connected in parallel to said input terminal of said operational amplifier through a resistor, said output terminal of said operational amplifier being connected to said first input terminal of said comparator, and wherein said differentiator comprises a capacitor which has one electrode connected across a resistor to said input terminal of said differentiator, the other electrode of said capacitor being serially connected to first and second operational amplifiers, respectively, between which is connected a resistor, the first and second operational amplifiers being shunted by first and second resistors respectively, the output terminal of said second operational amplifier being connected to said second input terminal of said comparator, and wherein said comparator comprises a first operational amplifier which has an input terminal connected across third, fourth and fifth resistors to said first, second and third input terminals, respectively, of the comparator, said first operational amplifier being shunted by a resistor and having an output terminal connected across a resistor to an input terminal of a second operational amplifier, and the output terminal of said operational amplifier is connected to said output terminal of said comparator.

3,884,532

VEHICLE LOAD-WEIGHING APPARATUS AND VALVE MEANS OPERABLE RESPONSIVELY THERETO

Roger Deschênes, Montfermeil, France, assignor to WABCO Westinghouse GmbH, Freinville-Sevran, France

Filed July 10, 1974, Ser. No. 487,128
Int. Cl. B60t *8/22*
U.S. Cl. 303—22 R **12 Claims**



1. Vehicle load responsive apparatus for use with a leaf type suspension spring supporting the vehicle frame, said apparatus comprising:

a. a leaf type spring supporting the vehicle load and deflectible to a degree corresponding to vehicle load;

b. a regulating valve device fixed on the vehicle frame and including valve means for regulating the pressure of an operating control fluid according to vehicle load;

c. operating means subject to a biasing force of predetermined magnitude acting thereon in a first direction and to a variable force exerted thereon by said leaf spring in a second direction opposite to said first direction and of a magnitude determined by the prevailing vehicle load, said operating means being responsive to a differential force between said biasing force and said variable force for effecting operation of said valve means to establish the pressure of said control fluid at a degree corresponding to said differential force; and d

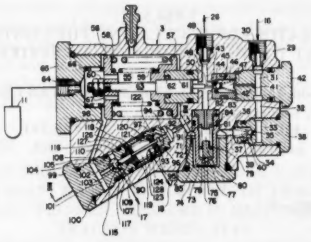
d. a self-centering member accommodated in a guide recess formed in said valve device, interposed between said spring and said operating means, and having a first convex surface in contact with the operating means and a second convex surface in contact with the spring at substantially diametrally opposite contact zones for transmitting said variable force from said spring to said operating means in a direction substantially normal to said spring and said operating means at said contact zones.

3,884,533

FLUID PRESSURE REGULATOR VALVE AND SAFETY VALVE ASSEMBLY

Toshihiro Abe, Kawagoe, and Kiyoshi Tokaiwa, Higashi-Matsuyama, both of Japan, assignors to Jidosha Kiki Kabushiki Kaisha, Tokyo, Japan

Filed July 11, 1973, Ser. No. 378,103
Claims priority, application Japan, July 11, 1972, 47-069481
Int. Cl. B60t *17/22*
U.S. Cl. 303—84 A **4 Claims**



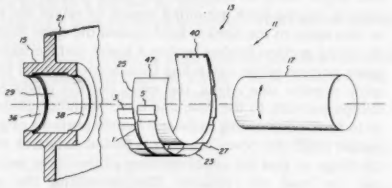
1. A fluid pressure regulating valve assembly for a dual, full pressure hydraulic brake system including independent brake fluid conduits branching from a common supply passage connected to a source of pressurized fluid, said assembly including a valve body, said supply passage and said two brake fluid conduits being coupled to said body, fluid accumulators coupled to said two fluid conduits downstream of said valve body, said valve body including fluid passages (**91, 92** and **98, 102**), for dividing the flow of fluid from said supply passage into two branches feeding said two conduits respectively, said valve body further including a distributing cylinder (**90**) including a wall (**109**) forming two separate pressure chambers (**123**, 125) on respective sides thereof, means connecting said fluid passages (**91, 92**) to one of said chambers and said fluid passages (**98, 102**) to said other chamber, and means fluidly coupling said chambers to said independent brake fluid conduits, a piston rod (**115**) slidably mounted within said partition (**109**), a balance spring mounted within said distributing cylinder and acting on said piston rod to maintain said piston rod in axial neutral position with the opposite ends of the piston rod being in respective pressure chambers (**123,125**), check valves (**94,104**) fluidly connecting said passages (92,102) respectively with pressure chambers (**123** and **125**) for normally permitting fluid flow from said passages into said chambers, and the ends of said piston rods being face to face with said check valves such that shifting of said piston rod in response to loss of pressure within one of said chambers

causes said piston rod to maintain the check valve within that chamber closed to prevent loss of pressurized fluid to the brake fluid conduit and the accumulator connected thereto.

3,884,534
INCREASED DAMPING HYDRODYNAMIC FOIL BEARING

Leo W. Winn, Schenectady, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Apr. 9, 1974, Ser. No. 459,018
Int. Cl. F16c *17/16*
U.S. Cl. 308—9 **7 Claims**

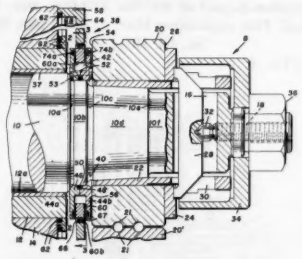


1. A resilient hydrodynamic foil bearing of the type wherein an inner bearing element is resiliently supported by at least one outer bearing element in a cavity between two relatively movable surfaces so that upon relative movement of said surfaces a hydrodynamic load carrying film is formed by deflection of said inner and outer bearing elements wherein the improvement comprises at least one generally longitudinal discontinuity in at least one of said outer bearing elements dividing it into two or more sections which coact with each other upon relative motion therebetween.

3,884,535
SEAL

Charles A. Rich, Jr., Southboro, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Apr. 29, 1974, Ser. No. 464,838
Int. Cl. F16c *1/24, 33/72*
U.S. Cl. 308—36.1 **10 Claims**



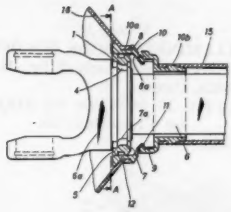
1. Apparatus for providing a seal between a housing and a rotatable shaft, comprising: a circular first sealing means supported on said shaft for rotation therewith, said first sealing means having a radially outwardly facing peripheral groove; a second sealing means supported by said housing, said second sealing means having an annular portion surrounding said first sealing means and protruding radially inwardly into said groove, with the surfaces of said protruding portion being spaced relative to the adjacent surfaces of said groove; and circular third sealing means supported by and rotatable with said first sealing means, said third sealing means in frictional contact with the said protruding portion of said second sealing means.

10. For use in combination with a roll shaft journalled for rotation in a roll housing, with one end of the roll shaft protruding from the housing to a axially receive a roll removably mounted thereon, and with roll parting adjustment means associated with the roll housing for adjusting the roll shaft, apparatus for providing a seal between the roll shaft and the roll housing, comprising: a circular flinger assembly mounted on the roll shaft for rotation therewith, said flinger assembly having an exterior groove formed by a base in sealing engagement with the roll shaft and opposed axially spaced flanges extending radially outwardly from said base; a wear ring having axially spaced inner and outer faces and radially spaced inner and outer edges, intermediate means in sealing engagement with the roll housing and the outer edge of said wear ring for supporting said wear ring in an operative position in said groove, the wear ring when thus supported having its inner edge spaced radially from said base and its inner and outer faces spaced axially from said flanges; and seal rings supported by and protruding from said flanges into engagement with the inner and outer faces of said wear ring.

3,884,536
PROTECTIVE GUARD DEVICE FOR A TRANSMISSION SHAFT

Theo Buthe, Lohmar, Rhine, Germany, assignor to Jean Walterscheid GmbH, Lohmar/Rhine, Germany

Filed June 11, 1974, Ser. No. 478,314
Claims priority, application Germany, May 30, 1973, 2327482
Int. Cl. F16c *17/10*
U.S. Cl. 308—37 **8 Claims**



1. A protective guard device for a transmission shaft assembly comprising a transmission shaft having yoke arms on the ends thereof and comprising tubular guard means enclosing the transmission shaft, there being annular grooves in said transmission shaft assembly at the junctures of the transmission shaft and the yoke arms, a radially expandible bearing member for each groove freely slidable over the portion of the transmission shaft assembly having the annular grooves therein when in the expanded position and when contracted seated into the respective groove, conical guard members at the ends of said tubular guard means extending over the respective yoke arms, connectors interconnecting said conical guard members to the respective ends of said tubular guard means and each having a locking lug engageable with said tubular means, said connectors each having a cylindrical surface therein defining a fitting step having a diameter approximately equal to the outer diameter of the bearing member when in the expanded position.

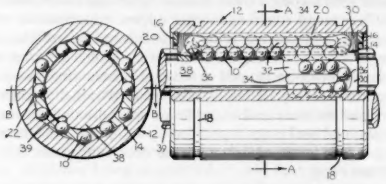
3,884,537
BALL BEARING ASSEMBLY

Albert R. McCloskey, Fairfield, Conn., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 15, 1973, Ser. No. 341,696
Int. Cl. F16c *17/00*
U.S. Cl. 308—6 C **2 Claims**

1. An anti-friction ball bearing assembly in combination with a shaft comprising an outer sleeve and an inner sleeve

concentrically fitting within said outer sleeve, said inner sleeve having a central opening for the passage of said shaft therethrough, balls, the inner sleeve having a number of tracks defining paths for the circulation of said balls between said sleeves and said shaft during relative movement between said shaft and said bearing assembly, the outer surface of the inner sleeve being polyhedronal in shape, the inner surface of the outer sleeve being provided with a number of guideways, the intersections of the plane portions defining the outer surface of the inner sleeve registering with said guideways, said inner



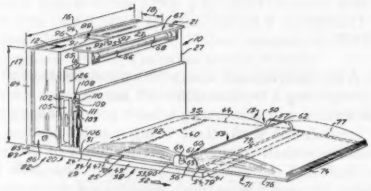
surface of the outer sleeve is further provided with a number of substantially concave bearing surfaces aligned with said tracks such that they provide a rolling bearing surface for said balls, while said balls are in their loaded state, said shaft having a plurality of longitudinally extending shallow raceways providing generally conforming bearing surfaces for said balls as they encounter said shaft and said raceways, said vertical depth of said raceways being only a fraction of the diameter of said balls, the length of said raceways on said circular shaft is at least equal to the linear travel of said bearing assembly, there being a raceway on said circular shaft for each track of balls.

3,884,538

ILLUMINATED BOOK HOLDER

Norman Dudley Wise, 1260 Charlwell Dr., West Vancouver, British Columbia, Canada

Filed Feb. 25, 1974, Ser. No. 445,093
Int. Cl. A47b *63/00*
U.S. Cl. 312—233 **11 Claims**



1. An illuminated book holder for holding a book, the book having a length, a width and a thickness, the holder having:

a. a generally plane base having spaced parallel inner and outer side edges and spaced parallel end edges, space between the side edges being no less than book thickness and space between the end edges being no less than the book length, the base having an upper surface having a base guide extending normally across from the inner side edge to the outer side edge,

b. a pillar member extending normally upwards from the base, the pillar member having spaced upper and lower edges and spaced end faces, space between the upper and lower edges of the pillar being no less than the book width and the space between the end faces being no less than the book length,

c. a cover member having spaced parallel inner and outer side edges and spaced parallel end edges, space between the side edges being no less than book width and space between the end edges being no less than the book length; the cover member having an upper surface having a cover member guide similar to the base guide and extending normally from the inner side edges across the cover member towards the outer side edges of the cover member to a position spaced sufficiently from the pillar member to permit the book to be opened to a generally fully opened condition, the cover member guide being adapted to be aligned with the base guide,

d. a hinge extending between the outer side edge of the base and the inner side edge of the cover member, the hinge hinging the cover member to the base for swinging thereabout,

e. a spine portion having spaced parallel side edges and spaced parallel end edges, space between the side edges being no less than book thickness and space between the end edges being no less than the book length, the spine portion having book retaining means to retain the book so that spine of the book is held against the spine portion, the spine portion further having a lower surface having a spine portion guide extending thereacross normal to the spine portion side edges, the spine portion guide being complementary to the base and cover member guides so as to form cooperating male and female portions of guide means when the cover member is folded outwards about the hinge so that the upper surfaces of the cover member and the base are coplanar, thus permitting the spine portion and the closed book to slide transversely across the base and cover member and concurrently being maintained generally normal to the side edges thereof by the guide means, to provide clearance between the book and pillar member to permit the book to be opened to the generally fully opened condition,

f. cover member securing means cooperating with the cover member and the pillar member, so that when the spine portion is adjacent the pillar member the cover member can be held upright in a position generally parallel to the pillar member to retain the closed book therebetween, the securing means being releasable to permit the cover member to swing downwards to permit opening the book,

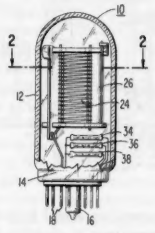
g. a lamp provided on the pillar member to illuminate pages of the book when opened.

3,884,539

METHOD OF MAKING A MULTIALKALI ELECTRON EMISSIVE LAYER

Alfred Hermann Sommer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 314,001, Dec. 11, 1972, abandoned. This application Mar. 4, 1974, Ser. No. 447,936
Int. Cl. H01j *9/38*
U.S. Cl. 316—6 **11 Claims**



1. A method of activating a multialkali electron-emissive cathode layer, of the type wherein a layer of antimony is exposed at elevated temperature, within an evacuated body, to vapors of a plurality of alkali metals including cesium, to form an electron-emissive compound, wherein the improvement comprises:

exposing the cathode layer to cesium vapor to achieve a photosensitivity exceeding approximately 0.1 microampere per lumen while maintaining the cathode at a temperature above 200°C.

3,884,540
MANUFACTURING PROCESS FOR SMALL BULBS

Jituo Hamai, Tokyo, Japan, assignor to Hamai Denkyu Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 31, 1973, Ser. No. 384,306

Claims priority, application Japan, July 31, 1972, 47-75842; July 31, 1972, 47-89086; Aug. 28, 1972, 47-85432; Aug. 28, 1972, 47-99307

Int. Cl. H01j *9/18*

U.S. Cl. 316—19 **4 Claims**

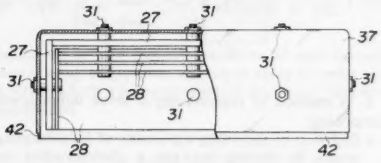
1. A method of making small bulbs by fusing bead mounts with elements therein to a bulb envelope comprising:

a. inserting a plurality of said bead mounts into a plurality of holes in a carbon jig plate;

b. placing a bulb envelope in contact with each of said bead mounts;

c. placing said carbon jig plate with the plurality of unsealed bulbs assembled thereon within a heat insulated box;

d. evacuating said heat insulated box;



e. heating said carbon jig plate to a temperature for inducing the generation of impure gases and withdrawing said impure gases, further raising the temperature to a value close to the softening point of said bulb envelopes and then further heating said carbon jig plate to a temperature sufficient to cause the fusing of said bead mounts and said bulb envelopes; and

f. gradually cooling the inside of said heat insulated box.

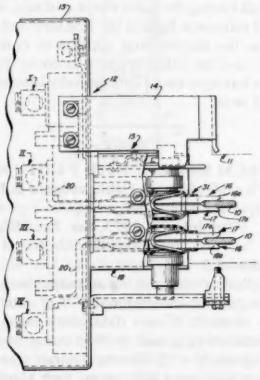
3,884,541
ASSEMBLY FOR CONNECTING A CURRENT TAKE-OFF UNIT TO A PLURALITY OF BUS BARS

Glenn S. O'Nan, Hamilton, Ohio; Allan E. Slicer, Brookville, Ind., and George N. Jorgensen, Oxford, Ohio, assignors to Square D Company, Park Ridge, Ill.

Filed Mar. 8, 1974, Ser. No. 449,299

Int. Cl. H01r *13/60*

U.S. Cl. 339—22 B **8 Claims**



1. In an electrical distribution system, an assembly for connecting a current take-off unit to a plurality of bus bars; said assembly comprising a housing and pairs of jaw members mounted within said housing and protruding outwardly therefrom; each pair of jaw members having corresponding ends for clampingly engaging a bus bar; an elongated connector piece secured to the opposite corresponding ends of said jaw members and adapted to be connected to the current take-off unit; first means for resiliently retaining said jaw members in a bus bar-clamping relation; adjustable second means for tightening said jaw members into said bus bar-clamping relation; an insulating element substantially encompassing a portion of said jaw members, said first and second means, and a portion of said connector piece disposed within said housing, and an elongated third means having at least a portion thereof disposed within said housing and engaging said second means, said third means having a segment thereof accessible from the housing exterior whereby manual adjustment of said third means is effected from said housing exterior.

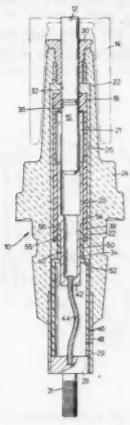
3,884,542
PRESSURE ACTUATED ELECTRICAL BYPASS CIRCUIT FOR A HIGH VOLTAGE BUSHING

Richard P. Flatt, Oconomowoc, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Mar. 14, 1974, Ser. No. 451,167

Int. Cl. H01r *13/52*

U.S. Cl. 339—111 **18 Claims**



1. A bushing for connecting electrical apparatus to the conductive member of a high voltage cable terminator, said bushing including: a dielectric housing having a passage, an electrically conductive contact positioned within said passage, said contact being adapted to electrically engage the conductive member in the terminator, a frangible member within said passage, means for connecting said contact to the electrical apparatus, and electrical bypass means within said bushing for connecting said contact to the conductive member when the pressure of the gas produced by the heat of the prestrike arc on close-in is sufficient to break the frangible member.

3,884,543
APPLIANCE CORD ANCHOR

Gary S. McCachren, Asheboro, N.C., assignor to General Electric Company, Bridgeport, Conn.

Filed Mar. 14, 1974, Ser. No. 451,070

Int. Cl. H01r *13/58*

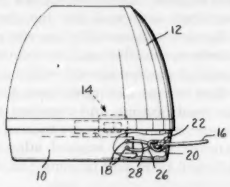
U.S. Cl. 339—105 **7 Claims**

1. In an electric device cord-connected to internal terminals by a slit portion having separated conductors connected to the terminals, an improved means anchoring the cord to the device comprising,

a cord opening to said device,

a cross member fixed to and straddling the opening on the inside of the device,

whereby the slit cord is pushed into the opening to bottom on the cross member with a conductor on each side



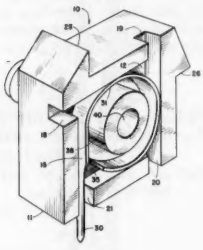
thereof for tying over the cross member before said terminals to limit ingress and egress of said cord.

3,884,544

CONNECTOR FOR CIRCUIT BOARDS OR THE LIKE

Robert Graham Lundergan, Camp Hill, and Paul J. Huntzinger, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 17, 1973, Ser. No. 407,326
Int. Cl. H01r *9/00*
U.S. Cl. 339—198 G **8 Claims**



1. In an assembly of connectors for connecting external male terminals to female terminals, with each connector comprising:

an insulative housing having first and second oppositely positioned major surfaces lying respectively in first and second parallel planes, said side surfaces joining said first and second major surfaces;

a recessed chamber formed into said first major surface having side walls which define a generally trapezoidal cross sectional configuration for said chamber in a plane parallel to said parallel planes;

said housing further formed to have a tubular element extend axially from the bottom of said recessed chamber outwardly towards the plane of said first major surface;

at least first and second apertures formed in said side walls, and extending between the side surfaces of said housing and said recessed chamber, with said first aperture constructed to receive one of said external male terminals;

contact means comprising a post-like portion and a curled-around portion and positioned within said recessed chamber with said curled-around portion positioned around said tubular element with the axis of said curled-around portion being substantially perpendicular to said parallel planes, and said post-like portion extending through the second of said apertures; and

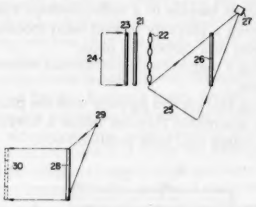
said housing further having a stub-like protuberance extending axially out from said second major surface and constructed to fit within the tubular element of a similar connector positioned adjacent thereto.

3,884,545

METHOD OF ELIMINATING GAPS BETWEEN THE EXIT PUPILS OF SUPERIMPOSED FOCUSED-IMAGE HOLOGRAMS

Tadashi Kasahara; Yoshiaki Kimura, and Masanori Kawai, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 11, 1972, Ser. No. 252,438
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **5 Claims**



1. A method of reproducing a three dimensional image comprising:

a first step of recording a plurality of focused-image holograms by placing between a photosensitive recording material and an array of first images of an object a lens array consisting of a plurality of multi-element photographic lenses mounted in an opaque mask in a uniform array such that the apertures of said lenses are uniformly spaced apart, each of said first images representing a different directional view of the object corresponding to the position of the image in the array of images, each of said lenses being disposed to form on said recording material a focused image of its corresponding first image, and illuminating said first images with coherent light and said photosensitive material with mutually coherent reference light, whereby said first images are recorded on said photosensitive recording material as an image hologram; and

a second step of reproducing said first images by illuminating said image hologram with incoherent light; wherein the uniform spacing between lenses is such as to define for each lens an area in which the lens is centered, each area being contiguous to those of adjacent lenses, the areas all having the same shape and size; and wherein one of said reference light in the first step and said incoherent light in the second step appears to come from a point source and the other appears to come from an extended source having a shape substantially identical to said shape of said area.

3,884,546

SPECTRUM SHAPING WITH PARITY SEQUENCES

David C. Chu, Menlo Park, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

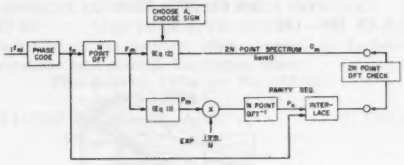
Filed July 30, 1973, Ser. No. 383,639
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **16 Claims**

1. A method of synthesizing an output array of elements in which an input two-dimensional $N \times Q$ data array is embedded, each element of said data array being indicative of a complex number $f_{n,q}$, said method comprising the steps of:

producing an $N \times Q$ discrete Fourier transform spectrum array of said input data array, each element of said Fourier transform spectrum array being a complex number $F_{m,p}$;

producing an extended spectral array of order $(yN) \times (zQ)$, y and z being integer numbers, at least one of y and z being greater than unity, each element of said extended spectral array being a complex number $G_{m,p}$ having a

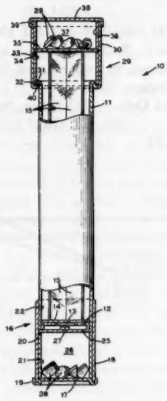
modulus and a phase each being a preselected value, subject to a condition among the elements of said extended spectral array given by an equation to be satisified for a substantial number of $F_{m,\,p}$



$$F_{m,\,p} = \frac{1}{yz} \sum_{i=0}^{y-1} \sum_{j=0}^{z-1} G_{m+iN,\,p+jQ} \quad ; \text{ and}$$

producing an inverse Fourier transform of said extended spectral array to generate an output array of order $(yN) \times (zQ)$ in which a representation of said input data array is embedded.

3,884,547
KALEIDOSCOPE
George Parrino, 98 Riverside Dr., New York, N.Y. 10024
Filed Apr. 18, 1974, Ser. No. 461,864
Int. Cl. G02b *27/08*
U.S. Cl. 350—5 **10 Claims**



1. A kaleidoscope comprising an elongated tubular body of circular cross-section,

a. said body having an eye opening at one end,

b. a revolvable unit of slightly larger diametrical size in overlapping relationship and projecting axially outwardly from said body at the opposite end, said revolvable unit having an outer wall

c. a transparent wall extending closurewise across a portion of said revolvable unit providing a recessed chamber at the end of said unit for holding a multiplicity of loosely assorted small pattern producing objects of irregular shapes,

d. a removable closure cap at the end of said unit in snug-fitting engagement with the outside surface of said outer wall of said revolvable unit permitting a user to change and replace said objects within said chamber at will,

e. a V-shaped reflector within said tubular body between said eye opening and said transparent wall,

f. a tubular storage compartment unit for holding said objects, said storage unit having a tubular outer wall with a projecting collar at one end and a bottom at its opposite end,

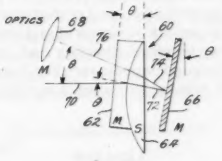
g. said projecting collar of said storage compartment unit adapted to frictionally, snugly and removably fit upon the viewing end of said tubular body,

h. a shoulder within said storage compartment unit within said tubular outer wall of said storage compartment unit, a removable cover which seats upon said shoulder,

i. said removable cover closing the interior of said storage compartment unit when it is placed in position upon said shoulder, said storage compartment unit used for storing and retaining said pattern producing objects therein,

j. means on said removable cover for lifting said cover from said storage compartment unit permitting a user to store and replace said pattern producing objects.

3,884,548
VARIABLE OPTICAL WEDGE FOR IMAGE STABILIZATION AND OTHER PURPOSES
Solomon L. Linder, St. Louis, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.
Filed Feb. 21, 1973, Ser. No. 334,260
Int. Cl. G02b *5/04*
U.S. Cl. 350—16 **10 Claims**

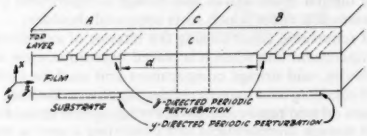


3. In an optical system including means for receiving and passing light from a remote source including directing exiting light in a predetermined direction therefrom regardless of changes in the position of the observed light source comprising an optical wedge including first and second adjacent wedge members, said first wedge member being a plano-concave lens element having a plane surface facing in the direction of the remote light source and an opposite concave surface having a radius of curvature equal to R, said second optical wedge member being a plano-convex lens element having a convex surface with a radius of curvature equal to R and an opposite plane surface, said convex surface being positioned adjacent to the concave surface of the first lens element, mirror means associated with the plane surface of one of said lens elements to reflect light exiting therefrom back through the optical wedge, means to stabilize the position of one of said lens elements, and means for moving the other lens element relative thereto, optical means including objective lens means, means connecting the objective lens means to the movable lens element for movement in concert therewith, movement of said optical means including the objective lens means and of the movable lens element to follow movements of the remote light source having relatively little effect on the position of the light exiting in the predetermined direction.

3,884,549
TWO DEMENSIONAL DISTRIBUTED FEEDBACK DEVICES AND LASERS

Shyh Wang, El Cerrito, and Sang K. Sheem, Albany, both of Calif., assignors to Regents of the University of California, Berkeley, Calif.

Filed Apr. 30, 1973, Ser. No. 355,454
Int. Cl. H01s *3/05*
U.S. Cl. 350—96 WG **14 Claims**

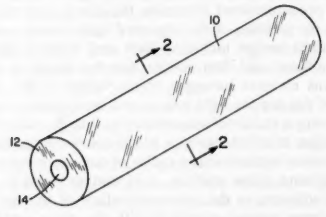


1. A thin film optical device comprising an optical waveguide having boundary surfaces and defining a guided wavelength for propagating wave of light at a predetermined frequency and guided wavelength therein, said waveguide having a predetermined optical index of refraction and made of a material transparent to light of said predetermined frequency, means defining at least one boundary layer adjacent to said waveguide such that the propagating wave for light at said predetermined frequency extends both within said waveguide and into said boundary layer, said boundary layer having one or more indices of refraction of said waveguide, perturbation means associated with said boundary layer and said waveguide for forming a first periodic variation of the index of refraction thereof in a first predetermined direction, said first periodic variation causing a spatial variation of said index of refraction between two values which repeat in a regular pattern of a first predetermined periodicity a_y, said perturbation means further forming a second periodic variation of said index of refraction in a second predetermined direction and causing a spatial variation of said second periodic variation between two values which repeat in regular patern of a second predetermined periodicity a_z.

3,884,550
GERMANIA CONTAINING OPTICAL WAVEGUIDE

Robert D. Maurer, and Peter C. Schultz, both of Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 4, 1973, Ser. No. 320,943
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 WG **8 Claims**

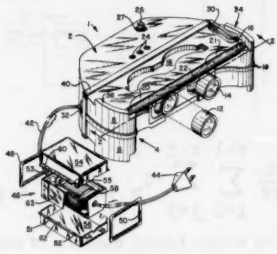


1. An optical fiber comprising
a cladding layer formed of high purity glass, and
a core of high purity germania containing glass having an index of refraction above that of the cladding layer, said high purity germania containing glass having a cation impurity level not exceeding ten parts per million of transition elements and a germania content in excess of 15% by weight, said optical fiber having light attenuation of less than about 80 db/km at the utilization wavelength or wavelengths of light.

3,884,551
STEREO VIEWER FOR A PAIR OF ARCUATE STEREO IMAGE STRIPS

Robert V. Bernier, Saugus, Calif., assignor to TRW Inc., Cleveland, Ohio

Filed Nov. 28, 1973, Ser. No. 419,525
Int. Cl. G02b *25/00*
U.S. Cl. 350—142 **10 Claims**

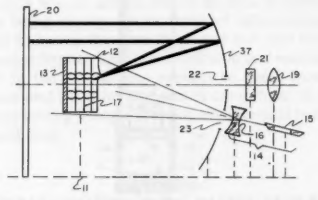


1. A stereo image viewer comprising, in combination:
a housing;
a means within said housing for receiving, positioning and holding a pair of arcuate stereo image film strips, each strip being held in a cylindrical plane for viewing;
lens means mounted within said housing for viewing said stereo image film pair; and
means for rotating said lens means to enable viewing all of the field of said stereo image film pair.

3,884,552
INVISIBLE TO VISIBLE LIGHT IMAGE CONVERTER

Reinhold Gerharz, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 5, 1973, Ser. No. 403,760
Int. Cl. G02f *1/28*
U.S. Cl. 350—161 **7 Claims**



1. An invisible to visible light image converter comprising:
an optical platform;
a Lippmann type space grating filter plate consisting of a layer of photographic emulsion having a multilayered lattice type of space grating imbedded therein having first and second broad surfaces and mounted in a first fixed position on said platform;
a localized source of visible light mounted in a second fixed position on said platform and having a beam angle and direction to fully illuminate said first broad surface of said plate;
a plane mirror mounted in a third fixed position on said platform with said first position between said second and third, said mirror also being within the beam angle from said source and oriented to fully illuminate said second broad surface; and

an objective optical means also mounted on said platform to project an invisible image of a distant object on said plate.

3,884,553

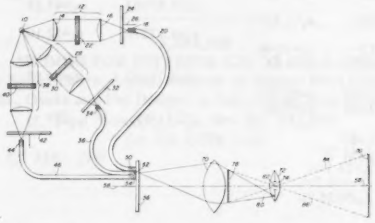
OPTICAL DISPLAY SYSTEM WITH IMPROVED SPECTRAL EFFICIENCY

Michael Graser, Jr., Bedford, Mass., assignor to Technical Operations Incorporated, Burlington, Mass.

Filed Jan. 16, 1974, Ser. No. 433,903

Int. Cl. G02b *5/18, 27/38*

U.S. Cl. 350—162 SF **21 Claims**



1. In Fourier transform optical apparatus for reconstructing on an optical axis an image from a record of that image located on said axis and which bears spatially periodic modulation with a unique carrier having a unique orientation in the record and relative to said axis, using light source means displaced a fixed distance from said axis at a prescribed azimuthal angle about said axis relative to said orientation to illuminate the record with a beam of light at such a diffraction angle to said axis that *n*-th order diffracted light from said beam falls on said axis (*n* being an integer greater than zero), said apparatus including a spatial filter mask with an aperture located on said axis for passing said *n*-th order diffracted light while substantially blocking zero-order light and light in diffraction orders other than said *n*-th order, for forming said image with said *n*-th order diffracted light, the improvement in light source means which comprises at least a first source of light in a first spectral range and a second source of light in a second spectral range that is different from said first spectral range, means locating said first source a first fixed distance from said axis at said azimuthal angle so as to illuminate the entire record with light in said first spectral range directed toward said axis at a first diffraction angle such that said unique carrier will diffract the light in said first spectral range so that only the *n*-th order diffracted light will pass through said aperture, means locating said second source a second fixed distance from said axis at said azimuthal angle so as to illuminate the entire record with light in said second spectral range directed toward said axis at a second diffraction angle such that said unique carrier will diffract the light in said second spectral range also so that only the *n*-th order diffracted light will pass through said aperture, and means to vary the relative intensities of said source or sources of light at the same azimuthal angle about said axis for controlling the effective color of light illuminating said image.

3,884,554

DISPLAY SHEET MATERIAL AND METHOD

Jerome H. Lemelson, 85 Rictor St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 849,117, Aug. 11, 1969, Pat. No. 3,684,614. This application Mar. 27, 1972, Ser. No. 238,570

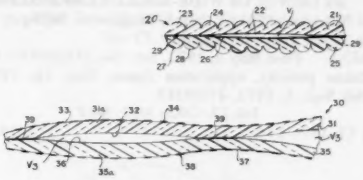
Int. Cl. B44f *1/06*

U.S. Cl. 350—164 **10 Claims**

1. A composite flexible display sheet material made of a plurality of thin light transmitting flexible plastic sheets comprising:

first and second sheets defining different strata of said sheet material,

means for joining said first and second sheets facewise together along a plurality of space-separated portions of said first and second sheets with juxtapositioned portions of said sheets between the joined portions of said sheets being unjoined and capable of some degree of relative shifting movement with respect to each other when the composite sheet material is deformed out of flatness,



each of said first and second sheets containing respective light diffracting means which cooperates with the light diffracting means of the other sheet in generating optical fringe pattern effects to an observer looking through said composite sheet material, and operable whereby, when the sheet material is flexed, said observed fringe pattern effects will appear to the observer to change in shape and to move a degree other than the degree of movement of the display sheet material during the flexure thereof.

3,884,555

OPTICAL SYSTEM CAPABLE OF EXTREME CLOSE UP PHOTOGRAPHY

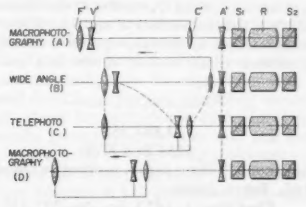
Michiharu Suwa, Tokyo; Akira Tajima, Kawasaki; Mamoru Shimazaki, Tokyo, and Noritsugu Hirata, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Sept. 18, 1973, Ser. No. 398,554

Claims priority, application Japan, Sept. 22, 1972, 47-95308

Int. Cl. G02b *15/18, 15/16*

U.S. Cl. 350—187 **14 Claims**



1. A variable focus optical system capable of extreme closeup photography comprising:

a first optical means for focussing said optical system on an object located at different distances within a selected normal range, said first optical means being movable along the optical axis of said optical system

a second optical means arranged on the optical axis of said optical system to vary the focal length of said optical system, said second optical means being operable independently of said first optical means, and having a first lens group and a second lens group which are mutually displaceable along said optical axis in a predetermined relationship for varying the focal length of said optical system

an extreme closeup mechanism for focussing said optical system on an object located at a distance closer than the normal range, said extreme closeup mechanism compris-

ing means for displacing both said first and second optical means in fixed relationship to each other along the optical axis of said optical system during operation of said extreme closeup mechanism, said second optical means also being operable independently of said extreme closeup mechanism for zooming said second optical means during the closeup operation.

3,884,556

RETROFOCUS WIDE-ANGLE LENS SYSTEM

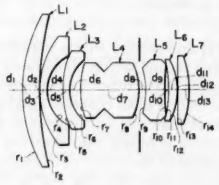
Jihei Nakagawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo-to, Japan

Filed May 4, 1973, Ser. No. 357,267

Claims priority, application Japan, May 10, 1972, 47-46084; Sept. 6, 1972, 47-89313

Int. Cl. G02b *9/62, 9/64*

U.S. Cl. 350—214 **10 Claims**



1. A retrofocus wide-angle lens system consisting of a first lens component being a positive meniscus lens, a second lens component being a negative meniscus lens, a third lens component being a negative meniscus lens, a fourth lens component means having a positive refractive power, a fifth lens component means having a negative refractive power, a sixth lens component being a positive lens, and said retrofocus wide-angle lens system satisfying the following conditions:

$0.4f < f_{123} < 0.8f, f_{123} < 0$

$0.5f < D_4 + D_5 < f$

where reference symbol f represents the total focal length of the lens system as a whole, reference symbol f_{123} represents the total focal length of said first, second and third lens components, reference symbol D_4 represents the distance from the front surface to the rear surface of said fourth lens component means and reference symbol D_5 represents the distance from the front surface to rear surface of said fifth lens component means.

3,884,557

MACROLENS

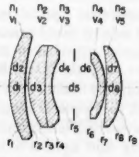
Sumio Nakamura, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1973, Ser. No. 337,135

Claims priority, application Japan, Mar. 2, 1972, 47-21678

Int. Cl. G02b *9/36, 9/40*

U.S. Cl. 350—221 **4 Claims**



1. A macrolens comprising four lens components, the first through fourth lens components, wherein said first lens component is a positive meniscus lens of which convex surface having a small radius curvature is directed to the object side, said second lens component is a negative meniscus doublet lens which is cemented with a positive meniscus lens and a negative meniscus lens directed their convex surface to the object side, said third lens component is a negative meniscus lens of which concave surface having a small radius curvature is directed to the object side, said fourth lens component is a positive meniscus lens of which concave surface having a large radius curvature is directed to the object side, said macrolens having the following numerical data

r_1=24.549	d_1=4.13		
		n_1=1.72000	ν_1=43.70
r_2=47.203	d_2=0.25		
r_3=14.356	d_3=4.26		
		n_2=1.67003	ν_2=47.25
r_4=70.080	d_4=1.30		
		n_3=1.67270	ν_3=32.10
r_5=9.613	d_5=10.90		
r_6=−10.177	d_6=1.54		
		n_4=1.76182	ν_4=26.55
r_7=−13.869	d_7=0.20		
r_8=−54.008	d_8=3.66		
		n_5=1.67000	ν_5=57.33
r_9=−15.167			

f=51.78

f_2=26.144

f_3=−16.706

f_{123}=138.96

where reference symbols r_1 through r_9 represent radii of curvature of successive lenses, reference symbols d_1 through d_8 represent thickness of successive lenses and distances between lenses on the axis, reference symbols n_1 through n_5 represent refractive indexes of successive lenses, reference symbols ν_1 through ν_5 represent Abbe's number of successive lenses, reference symbol f represents the total focal length of the whole lens system, reference symbols f_2 and f_3 respectively represent focal lengths of the front and rear lenses of the cemented second lens component and reference symbol f_{123} represents the total focal length of the first and second lens components.

3,884,558

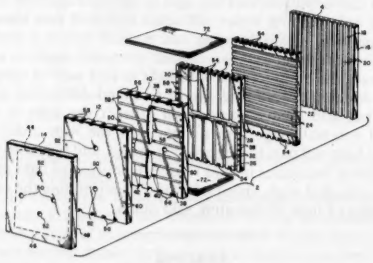
STABILIZED THERMALLY COMPENSATED MIRROR

Charlton Dunn, III, Chatsworth; Ronald D. Tobin, Newbury Park; Neil E. Bergstreser, Canoga Park, and Theodore A. Heinz, Moorpark, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed July 3, 1972, Ser. No. 269,674

Int. Cl. G02b *5/08*

U.S. Cl. 350—288 **4 Claims**



1. A thermally compensated mirror comprising:

a laminated structure formed by

a front plate having a reflective front surface and having a plurality of grooves formed in the rear surface for conducting coolant fluid in heat exchanging relation with said reflective surface,

a rear plate,

a minimum temperature plate interposed between said front and rear plates and formed with a plurality of

coolant distribution passageways coupled to receive coolant fluid before said coolant fluid has been passed to said front plate and oriented to distribute coolant fluid in a manner to establish a minimum temperature plane parallel to said reflective surface,

a temperature stabilization plate interposed between said front plate and said minimum temperature plate and formed with a plurality of coolant distribution channels coupled to receive coolant fluid after said coolant fluid has passed in heat exchanging relation with said reflective surface and oriented to distribute said coolant fluid in a manner to establish a uniform temperature plane parallel to said reflective surface, and

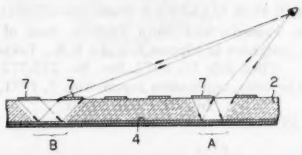
means for circulating said coolant fluid through said structure.

3,884,559

MIRROR FOR INTERIOR DECORATIVE USE

Yuji Baba, Tokyo, Japan, assignor to Nippon Steel Glass Co. Ltd., Osaka and Uni Design Co. Ltd., Tokyo, both of, Japan

Filed Mar. 19, 1973, Ser. No. 342,883
Int. Cl. G02b *5/08*
U.S. Cl. 350—288 **13 Claims**



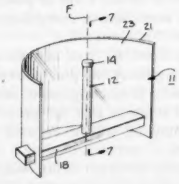
1. A mirror for interior decorative use, said mirror comprising a transparent glass sheet having a front surface and a rear surface; at least one layer of a colored pattern on said front surface; and an image-reflecting layer on said rear surface, said colored layered pattern comprising a plurality of discreet areas each having a width substantially the same as the spacing between adjacent ones of said discreet areas with said discreet areas and said spacing therebetween being substantially equal to the thickness of said transparent glass sheet.

3,884,560

PACKAGE AND REFLECTOR ASSEMBLY FOR A LIGHT SOURCE

William J. Neylan, 1045 Fifth Ave., New York, N.Y. 10028, and Harvey Blomberg, 134-14 231st St., Laurelton, N.Y. 11413

Filed Nov. 26, 1971, Ser. No. 202,358
Int. Cl. G02b *5/10*
U.S. Cl. 350—293 **10 Claims**



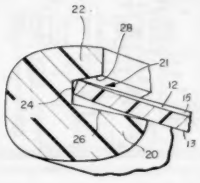
1. A reflector assembly package for projecting light developed by a chemiluminescent light generating device comprising a flexible sheet having a light reflective portion on at least one surface thereof; a receptacle member releasably adhered to said sheet; a chemiluminescent light generating device disposed within said receptacle member; means for interengaging said sheet and said receptacle member upon removal of said member from said sheet, and distortion of said sheet into position to define a concave surface from said light reflective portion on said sheet; and means for mounting said device on said receptacle member in a light projecting position relative to said light reflective portion on said sheet.

3,884,561

LENS HOLDING GROOVE MEANS

Edmund Kodys, Westminister, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.

Filed Jan. 30, 1974, Ser. No. 438,103
Int. Cl. G02c *5/00*
U.S. Cl. 351—83 **3 Claims**



1. In combination

a substantially rigid metal frame portion of a pair of spectacles including a pair of openings for receiving a pair of lenses therein;

a pair of substantially flexible lenses having a forwardly extending convex curvature mounted in said lens openings, each of said lenses having a front and rear surface and an edge extending about its periphery;

each of said lens receiving openings in said front frame including a lens receiving groove means which receives the edge of each of said lenses and extends completely around the periphery thereof;

each of said groove means comprising a front ledge portion joined to a rear ledge portion and spaced therefrom to form a lens receiving groove therebetween, said front and rear ledge portions being integral with said substantially rigid metal frame portion;

each of said front ledge portions extending inwardly from the edge of said lens mounted in each of said grooves and contacting a curved portion of the front surface of said lens spaced inwardly from the edge of said lens;

each of said front ledge portions extending inwardly from the edge of said lens mounted in each of said grooves a substantially greater distance than said rear ledge portions, said rear ledge portions being positioned to contact at least a portion of the edge of the rear surfaces of each said lenses mounted in said grooves to aid in maintaining said lenses in said grooves; whereby,

each of said lenses is insertible in its respective groove by flexing it to allow its edge to pass over said lesser inwardly extending rear ledge portion and into said groove, said further inwardly extending front ledge portion covering from view the outermost peripheral portion of each lens mounted in said groove.

3,884,562

VIEWER PROVIDING AUTOMATIC CASSETTE LATCHING AND EJECTION

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 227,093, Feb. 17, 1972. This application Jan. 2, 1974, Ser. No. 430,028
Int. Cl. G03b *23/02*
U.S. Cl. 352—74 **14 Claims**

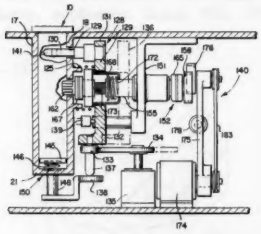
1. Photographic apparatus for use with a photographic

cassette including a cassette housing configured to retain a strip of photographic film, said apparatus comprising:

an apparatus housing;

means for receiving such cassette in operative position in said apparatus for purposes of actuating such cassette through a predetermined program, said receiving means including a cassette-receiving well;

means for locating and latching such cassette in said well including a latch member configured for displacement into said well for engagement with such cassette so as to operatively position said cassette in said well and to preclude removal of such cassette from said well, the operation of said locating and latching means being responsive to the insertion of such cassette into said well;



selective operable means for operating such cassette through a predetermined program;

means responsive to said locating and latching means performing its cassette locating and latching functions for actuating said cassette operating means; and

means responsive to the completion of such predetermined program for withdrawing said latch member from engagement with such cassette and for subsequently at least partially displacing such cassette from its operative position.

3,884,563

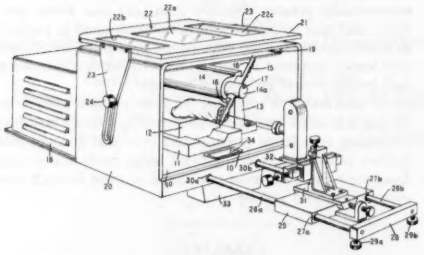
MICROTOME WITH ROTATING KNIFE

James King Evans, Reading, Pa., and Roy Mills, Rossville, Ind., assignors to John C. Fox, Auburn, N.Y., a part interest

Division of Ser. No. 132,120, April 7, 1971, abandoned. This application May 30, 1973, Ser. No. 365,048

Int. Cl. G03b *29/00*

U.S. Cl. 352—131 **9 Claims**



1. An apparatus for producing a motion picture of serial sections of a frozen organic specimen which when exhibited gives the impression that an observer is moving through the specimen, thus permitting the tracing of selected elements or features through the specimen comprising:

a rotating knife,

means for achieving relative motion of the knife and the specimen along an axis approximately parallel to the axis of rotation of the knife and within the periphery of the circle of rotation of the knife, so that said relative motion results in the cutting of serial sections from the specimen by the knife,

a thermally insulated housing enclosing the knife and the specimen, the housing containing at least one thermally insulated window to enable examination of the specimen's cut surfaces,

refrigeration means for maintaining the interior of the housing within the temperature range of −30°C. to +30°C.,

motion picture recording means, for serially recording the appearance of the surfaces of the specimen exposed by sectioning,

means to support the recording means outside the enclosure adjacent the window,

means for adjusting the position of the support means relative to the specimen, and

timer means for synchronizing the recording means with the rotating knife, so that the recording means is activated at least once after each new surface of the specimen is exposed by sectioning.

3,884,564

DEVICE FOR MAKING A PAIR OF STEREO-MAPS

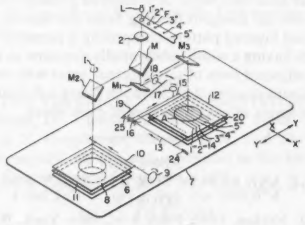
Munesato Yamada, and Shuji Yoshida, both of Kanazawa, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed July 21, 1972, Ser. No. 273,772

Claims priority, application Japan, Aug. 5, 1971, 46-58632

Int. Cl. G03b *21/00*

U.S. Cl. 353—6 **7 Claims**



1. A device for graphically reconstructing a series of sections, each of which is obtained by sectioning an object at various levels thereof, in the form of paired stereo-maps for observation with a stereoscope, comprising:

a support means (**7**);

a first recording sheet (**6**) fixed on said support means;

a second recording sheet (**8**) placed over said first sheet;

an optical system for projecting one of said series of sections on the second sheet so that the projected image of said one section may be traced on said second recording sheet, said optical system including a projection lens and reflection means, the latter being adjustable to adjust the position of each projected sectional image relatively to said second recording sheet; and

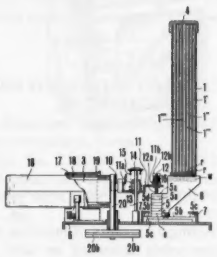
duplicating means (**11**) interposed between said first and second recording sheets to duplicate said traced image onto said first sheet;

said manually operable slider sliding said second recording sheet in said one direction to give a parallax in accordance with the perspective of a new section to be traced on said second recording sheet.

3,884,565
SYNCHRONIZING DEVICE FOR PICTURE-STORY SHOW AND CARTRIDGE TAPE PLAYER

Yuji Tanno, Tokyo, Japan, assignor to ABE Engineering & Development Co. Ltd., Japan

Filed June 15, 1973, Ser. No. 370,410
Claims priority, application Japan, July 18, 1972, 47-71301
Int. Cl. G03b *31/06*
U.S. Cl. 353—15 **5 Claims**



1. A device for synchronizing visual display of a plurality of picture boards with an aural program played from a tape within a cartridge, comprising:

A. said cartridge tape comprising a corresponding plurality of record tracks aligned in order of sounds and voices recorded thereon to be reproduced throughout the aural program,

B. a picture casing for holding the plurality of picture boards in a predetermined display order corresponding to the order of said aural program on said plurality of record tracks and allowing sequential removal of the boards in said display order, exposing successive boards to view,

C. said plurality of picure boards being provided with a corresponding plurality of corner cuts in the respective boards, each board having one cut, each cut having a different depth, the depth of said cuts increasing from board to board in said predetermined display order, said cuts forming stopper surfaces,

D. a support plate having a first end and a second end, the support plate being mounted in a movable manner,

E. spring means for imparting a force to the support plate in a predetermined direction to thereby tend to move the support plate in the predetermined direction,

F. a playback head mounted on said first end of said support plate for movement across said record tracks when the support plate moves in the predetermined direction,

G. a support leg adjustable in the predetermined direction including a first end thereof, the support leg being mounted on said second end of the support plate,

H. a guide member comprising a stopper and a plurality of steps corresponding in number to the plurality of record tracks,

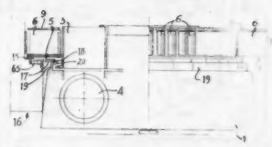
I. means including a coil spring for pulling the guide member in a direction parallel to the picture boards until the stopper of the guide member is stopped by the stopper surface of the corner cut in the board currently positioned for display and

J. means for causing said first end of the support leg to move into contact with whichever one of the plurality of steps is currently adjacent to it in accordance with the board currently positioned for display and thereby moving the support plate to cause the playback head to reproduce the corresponding record track.

3,884,566
TRANSPARENCY PROJECTOR HAVING A DEVICE TO ALLOW THE PLAYBACK OF SOUND RECORDINGS

Marcel Jules Helene Staar, 479 Avenue Louise, Brussels, Belgium

Continuation of Ser. No. 35,961, May 11, 1970, abandoned. This application Mar. 5, 1973, Ser. No. 338,402
Int. Cl. C03b *31/06*
U.S. Cl. 353—19 **12 Claims**



1. In an automatic sound transparency slide projector, in combination; a compartmented transparency-supporting magazine for holding the transparencies radially arranged about a central axis; a control device adapted to provide a rotary movement by which the transparencies are successively projected by the projector; a ring on said magazine; a radially extending band supported on said ring in coaxial alignment with each transparency compartment and being disposed at the outer radii of the transparency compartments, said band being an endless magnetic recording tape located so that upon a given transparency being projected a corresponding associated recording on said tape is located in a playback position; a unit comprising a playback and recording apparatus being mounted on said projector for driving and reading the recording tape associated with the transparency being projected at any particular time intervals; projections on the outer edge of said ring in positions corresponding respectively to the axis of the transparency compartment; a solenoid including a circuit; switching means in said circuit of the solenoid; a mechanical connection extending between the armature of the solenoid and a playback head on said playback and recording apparatus whereby, when the solenoid is energised during the closure of said switch by one of the projections, the playback head is permitted to move into a position to start the playback.

3,884,567
FILM LOADING ASSEMBLY

Alexander Jesensky, Lake County, and Frederick D. Meller, Lombard, both of Ill., assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Aug. 16, 1973, Ser. No. 388,814
Int. Cl. G03b *1/48, 23/08*
U.S. Cl. 353—23 **19 Claims**

1. A device for maintaining a first film having at least one reproducible image disposed thereon in a planar, stationary condition for illumination by a radiant energy source comprising

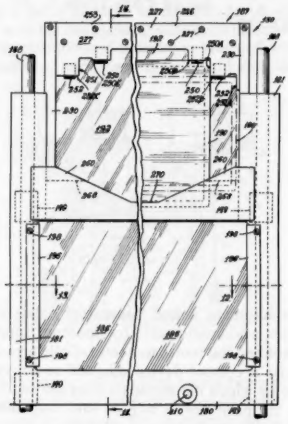
first and second transparent planar members for maintaining said film in said planar, stationary condition therebetween,

a support frame means,

said first member being mounted on said frame means in a relatively stationary condition with respect to said device, said first member having a first planar surface defining an image plane for receiving and maintaining said first film in said planar, stationary condition,

said second member being relatively movably mounted in said device, said second member including first means for receiving and for releasably securely retaining said first film in engagement with said second member and

means for controlling the movement of said second member along a path of travel wherein at least a portion of said path of travel is along a first elongated axis disposed in a plane substantially parallel to said image plane, said path



of travel including first and second points therealong, said second member being adapted to receive said film at least at said first point and adapted to position and maintain said film in said planar, stationary condition in said image plane at said second point.

3,884,568.

PROJECTION DEVICE FOR EXPOSING SPHERICAL SURFACES

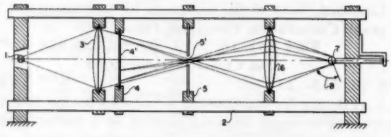
Walter Fritzsch, Stetten, Germany, assignor to Dornier-System GmbH, Germany

Filed June 25, 1973, Ser. No. 373,257

Claims priority, application Germany, Aug. 11, 1972, 2239620

Int. Cl. G03b *21/14*

U.S. Cl. 353—62 **1 Claim**



1. In a projection device for exposing a spherical surface to light including a light source, a condenser lens, a pattern holder, and an imaging lens,

the improvement comprising aperture stop means between said condenser lens and said imaging lens, said aperture stop means having a light-transmissive opening means therein which is the minimum aperture for accurate projection, whereby only those projected rays will pass through for the formation of an image which, at the point of their representation, impinge upon the spherical surface with as large an angle as possible with respect to the tangential plane at the point of impingement of the rays.

3,884,569

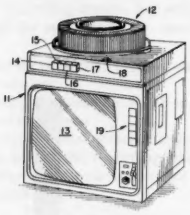
SLIDE TRAY AND SLIDE POSITIONING MECHANISM FOR A REAR-SCREEN PROJECTOR

Roy E. Hickey, Honeoye Falls, N.Y., assignor to The Singer Company, New York, N.Y.

Filed May 29, 1973, Ser. No. 364,399

Int. Cl. G03b *21/14, 23/02*

U.S. Cl. 353—88 **15 Claims**



1. Apparatus for projecting slides comprising:

a slide projector;

a slide tray, including a plurality of indexing pins depending therefrom, removably mounted on said projector and adapted to contain a plurality of slides for projection by said projector;

said projector including:

a gate;

said gate including a flat shutter member rotatably mounted near one end thereof about an axis in a plane substantially normal to the optical path of said projector;

said shutter having a first position blocking hte optical path of said projector and a second position for which the optical path of the projector is not blocked;

indexing means adapted to rotate said slide tray relative to said gate for successively bringing slides in said slide tray, one at a time, into substantially vertical registration with said projector gate; and

first means operating in time relation with said indexing means for successively feeding said slides substantially vertically from said tray into said gate under the influence of gravity, for projection, and from said gate substantially vertically back into said tray;

said indexing means including:

a driven indexing bar having a slide tray indexing element at one end thereof;

pivoted means including a rotatably pivoted, substantially flat, member having a slot therein a distance from said pivot coupled to said indexing bar by means of a pin depending from said driven indexing bar and extending into said slot in said pivoted member; said pivoted member guiding said indexing element to a position between two adjacent pins depending from said slide tray and then rotating said indexing bar around the pivot of said pivoted means to rotate said slide tray as said indexing bar is driven; and

second means in time relation with said indexing for causing said shutter to be in its first position in response to the absence of a slide to said gate and for causing said shutter to be in its second position in response to the presence of a slide in said gate;

said second means including:

means biasing said shutter in said second position;

means for rotating said shutter around said rotational axis to said first position in opposition to said biasing means and for enabling counter-rotation of said shutter around said rotational axis to said second position under the urging of said biasing means;

said means for rotating said shutter including an elongated member having a camming surface thereon in contact with the flat surface of said shutter member;

said elongated member adapted to be reciprocated in a direction transverse to the optical axis of said projector and in a plane substantially parallel to the rotational axis of said shutter with said camming surface to contact with the flat surface of said shutter to rotate said shutter to said first position;

means for sensing the absence of a slide in said gate for latching said elongated member in a position wherein said shutter is at said first position and for sensing the presence of a slide in said gate for enabling the return of said shutter to said second position;

a stationary slide guide located at said projector gate;

a slide clamp rotatably mounted on an axis in a plane substantially normal to the axis of said optical path; and

means biasing said slide clamp toward said slide guide.

3,884,570

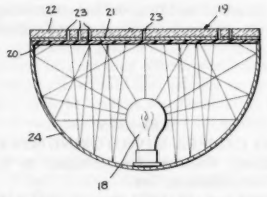
READER FOR REFLECTIVE BACKGROUND MICRORECORDS

Adnan Waly, Stamford, Conn., assignor to Personal Communications, Inc., Stamford, Conn.

Division of Ser. No. 214,899, Jan. 3, 1972, abandoned. This application Oct. 23, 1973, Ser. No. 408,577

Int. Cl. G03b *21/28, 21/11, 23/08*

U.S. Cl. 353—98 **8 Claims**



1. A reader for a microrecord constituted by a base of transparent film material having a layer of highly reflective material thereon forming an image background and a micro-image intelligence pattern on said base defined by shaped-light permeable openings in the reflective layer, said reader comprising:

A. a viewing screen,

B. a light source producing light rays which are radiated toward the reflective layer on said microrecord and pass through said openings to present said intelligence pattern on said screen, the rays impinging on said reflective layer being reflected back, and

C. reflective means contoured to collect and reflect said reflected-back rays and to return them toward said microrecord to cause substantially all rays emanating from said source to ultimately pass through the light-permeable openings in the microrecord whereby the light available from said source is fully exploited, said reflective means being constituted by a concave reflector whose mouth is fully covered by said microrecord.

3,884,571

LEAKAGE DEVELOPER RECIRCULATION ASSEMBLY

Adalbert A. Lux, Penfield, N.Y.

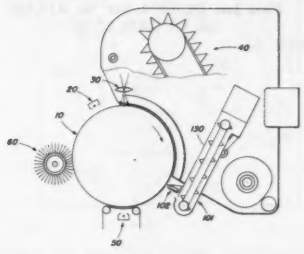
Filed May 5, 1972, Ser. No. 250,637

Int. Cl. G03g *15/08*

U.S. Cl. 355—3 **7 Claims**

1. In an electrostatographic apparatus containing a development station for developing an electrostatic latent image formed on a surface including a developer housing in which solid developer is stored, transported to the electrostatic latent image bearing surface and received from said electrostatic latent image bearing surface, the improvement comprising:

catch means positioned externally to said developer housing for receiving solid developer which leaks past the developer housing during the development of the electrostatic latent image, said catch means comprising a tray positioned beneath said developer housing adjacent to the electrostatic latent image bearing surface to receive developer leaks between the electrostatic latent image bear-



ing surface and the developer housing, said tray including an outlet port for withdrawing developer therefrom, and a conveying means in said tray for conveying developer within said tray to said outlet port, said conveying means comprising a movable endless belt journaled in said tray, and

means for transporting the developer from said outlet port to said developer housing.

3,884,572

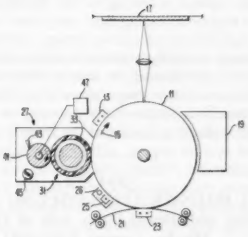
CLEANING APPARATUS

James L. Bacon, and Henry W. Simpson, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1972, Ser. No. 317,974

Int. Cl. B08b *1/02*

U.S. Cl. 355—15 **5 Claims**



1. Cleaning apparatus for removing electrostatically charged toner particles from the surface of an electrostatic plate comprising:

a continuous wiper means mounted for movement in a closed loop in wiping engagement with the surface of the electrostatic plate containing toner particles attracted thereto for removing said toner particles from said electrostatic plate, said wiper means comprising at least an outer layer of a compliant material having a resistivity of less than 10^{+8} ohm. centimeters and having an outer skin thereon;

cleaning means engagingly connected to said wiper means for removing toner therefrom;

drive means for moving said wiper in said closed loop past said electrostatic plate and past said cleaning means;

a current source connected to said wiper means for supplying current to the outer skin of said wiper means propor-

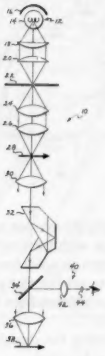
tional to the image charge of the toner in contact therewith.

3,884,573

APPARATUS FOR HIGH RESOLUTION PROJECTION PRINTING

David M. Franklin, Lexington, Mass., assignor to The Computervision Corporation, Bedford, Mass.

Filed Jan. 29, 1974, Ser. No. 437,746
Int. Cl. G03b 27/50
U.S. Cl. 355—51 7 Claims



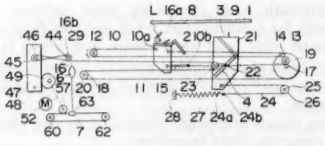
1. A high resolution projection printer comprising:
1. means for positioning a light transmitting planar object at an object plane;
2. means for illuminating a light transmitting planar object positioned at said object plane;
3. means for optically scanning an illuminated light transmitting planar object positioned at said object plane;
4. optical means for forming at an image plane, an erect, unity image of an illuminated light transmitting planar object positioned at the object plane in synchronization with the optical scanning of the illuminated object, said optical means including first and scond matched, infinity corrected objectives and an image erecting prism means positioned optically between said objectives; and,
5. means for positioning an unexposed, planar photosensitive element at the image plane whereby the photosensitive element is sequentially exposed in synchronization with the optical scanning of the illuminated object.

3,884,574

PLURAL MAGNIFICATION COPYING APPARATUS

Yasuhiko Doi, and Hiroshi Ikeda, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 21, 1974, Ser. No. 444,367
Claims priority, application Japan, Feb. 27, 1973, 48-24993
Int. Cl. G03b 27/70
U.S. Cl. 355—66 9 Claims



1. In a copying apparatus wherein image rays from a stationary original to be copied are directed at a certain magnification by a first carriage supporting a mirror and a lamp, a second carriage supporting at least one further mirror, and a lens carriage supporting a lens onto a photosensitive material moving at a certain speed, said second carriage being moved at half the speed of said first carriage, the length of the light path from the original to said lens carriage being thereby kept constant irrespective of the position of said first carriage, the improvement which comprises a means for shifting said lens carriage and said second carriage to positions corresponding to predetermined magnification, and a means for changing moving speeds of said first and second carriages in accordance with said magnification,

said shifting means comprised of a single cam having a plurality of cam surfaces with each of said surfaces defining a shifting distance of said second carriage, a rotatable member mounted for rotation about an axis and positioned in contact with one of said surfaces of said cam, a first cable connecting said rotatable member and said second carriage, and a means interconnecting said cam with said lens carriage, whereby upon rotation of said cam said rotatable member rotates about its axis for moving said second carriage by said first cable while said lens carriage is being moved through said interconnecting means, both of said second carriage and said lens carriage thereby being moved to positions corresponding to said predetermined magnification,

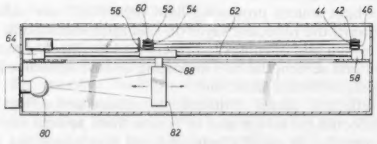
and said speed changing means being comprised of a plurality of clutch means operatively associated with a plurality of gears having different tooth ratios for controlling the moving speeds of said first and second carriages in accordance with said predetermined magnification.

3,884,575

PROCESS CAMERA MONOTORING APPARATUS

Warren Childers, Houston, Tex., assignor to Graphic Arts Mfg. Co., Inc., Houston, Tex.

Filed Jan. 29, 1973, Ser. No. 327,828
Int. Cl. G03b 27/27
U.S. Cl. 355—68 9 Claims



1. Apparatus for monitoring light level within a process camera having a lamp for a flashing exposure, comprising:

a light sensitive device;

a light emitting device exposed to said light sensitive device; and,

means connected to either said light sensitive device or said light emitting device and adapted to be connected to a process camera in a manner to vary the relative position of said light emitting device to said light sensitive device and which is adapted to control a flashing exposure for an image receptor in the process camera, said means altering the light falling on said light sensitive device.

3,884,576
EXPOSURE UNIT FOR A COPYING MACHINE HAVING A VARIABLE MAGNIFICATION

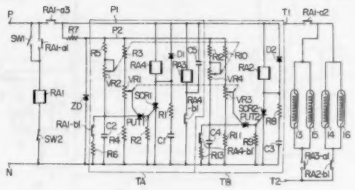
Hideaki Mochimaru; Shigeru Suzuki, both of Yokohama; Yohei Ikezu, Tokyo; Masao Yaeshima, Sendai, and Takeshi Ukai, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1973, Ser. No. 421,324

Claims priority, application Japan, Dec. 15, 1972, 47-12588; Dec. 29, 1972, 47-03737

Int. Cl. G03b *27/76*

U.S. Cl. 355—69 **7 Claims**



1. An exposure unit for a copying machine having a variable magnification, the exposure unit comprising

a. an optical system, including a lens having an optical axis, for projecting an image of an original to be copied, said optical system being adjustable, to vary the magnification of the image, in a manner effecting lateral displacement of the optical axis of said lens relative to the original;

b. a plurality of light sources for illuminating the original, disposed in succession along the path of displacement of said optical axis; and

c. means for controlling time periods during which the plurality of light sources are energized such that different ones of said light sources respectively disposed at different locations along said path are energizable for respectively different time periods to compensate for displacement of said optical axis and thereby to maintain a uniform exposure distribution.

3,884,577
METHODS AND APPARATUS FOR OBJECT REPRODUCTION

Richard A. Carpentier, 41 Half Circle Dr., Holbrook, N.Y. 11741; Paul L. Di Matteo, 6 Carol Ct., Dix Hills, N.Y. 11746; Howard K. Stern, 89 Derby Ave., Greenlawn, N.Y. 11740, and Ernest C. Wittke, 1600 Grand Ave., Baldwin, N.Y. 11750

Filed Jan. 8, 1973, Ser. No. 321,732

Int. Cl. G03b *21/06*

U.S. Cl. 355—77 **12 Claims**

1. Apparatus for use in the reproduction of a three-dimensional object, comprising:

a. first means for supporting said object;

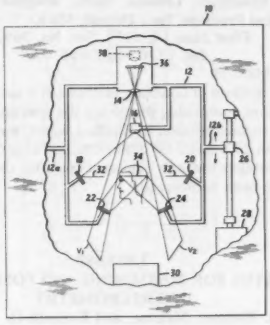
b. second means for generating a plurality of separate overlapping radiant energy images of said object, said second means defining an interior in which said object is positionable and supporting at said interior in mutually fixed relation:

1. lens means providing said separate overlapping images and being inclusive of at least one lens;

2. means for projecting radiant energy in a predetermined planar portion of said interior;

3. a plurality of radiant energy reflective means, each disposed in distinct viewing relation to said predetermined interior portion, each pair of said reflective means being further disposed in the field of view of at least one lens in said lens means; and

4. image rotating means for separately turning the plane of each of said images provided by said lens means to effect joint focusing and positioning thereof in a common plane; and



c. third means for providing relative movement between said first and second means to selectively position said object within said second means.

3,884,578
PHOTOGRAPHIC COPYING APPARATUS

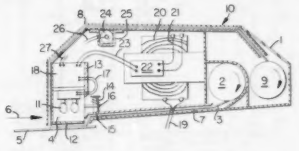
Raymond Albert Roosen, B2232's-Gravenwezel, Parklaan 12, Belgium

Filed Aug. 9, 1973, Ser. No. 386,889

Claims priority, application United Kingdom, June 18, 1973, 37453/73

Int. Cl. G03b *27/30*

U.S. Cl. 355—100 **6 Claims**



1. In a portable reflex copying apparatus adapted to be moved across the surface of an original to be copied to reproduce at least a portion thereof, said apparatus comprising a housing adapted for placement on said original and providing in the lower side thereof an exposure zone through which a portion of said original is visible, means in said housing for holding a supply web of radiation-sensitive recording material and means in said housing for collecting such material after exposure, guiding means in said housing for guiding said web from said web supply holding means through said exposure zone to said collecting means, web-advancing means for advancing the thus guided web between said supply means and said collecting means through said exposure zone, said advancing means including roller means journaled in said housing to project externally from the lower side thereof for rotation by frictional contact with the surface of said original, said rotation being transmitted to said web to advance the same at a rate corresponding to the speed of rotation of said roller means, at least one light source in said housing adjacent said exposure zone to reflexively expose the recording material passing therethrough to the underlying portion of said original, in combination an improved exposure control means for said light comprising triggering means cooperating with said roller means and periodically activated upon rotation of said roller means through successive equal predetermined arcs of rotation to generate electrical pulses, and lamp switching means responsive to said pulses to energize said lamp from an inoperative to an operative condition for the period of each said pulses.

3,884,579

METHOD FOR COUNTING BLOOD PLATELETS

Thomas Mauthner, Livonia, Mich., assignor to Cambridge Chemical Products, Inc., Detroit, Mich.

Filed June 14, 1973, Ser. No. 369,827
Int. Cl. G01n *33/16*, *1/00*
U.S. Cl. 356—39 2 Claims

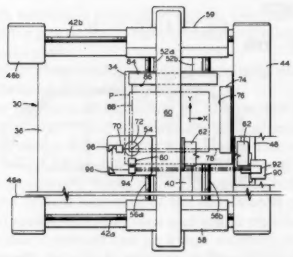
1. The method of counting platelets in a specimen of whole blood serum comprising dissolving the specimen in a solution having a surface tension in distilled water, measured at 22°C of between 29.8 and 31.0 dynes/cm, and observing and counting the platelets through a microscope after the red and white cells have been hemolyzed.

3,884,580

APPARATUS FOR MEASURING AND POSITIONING BY INTERFEROMETRY

Ronald B. Webster, Melrose, and Kenneth O. Wood, Hebron, both of Conn., assignors to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed Sept. 7, 1973, Ser. No. 395,010
Int. Cl. G01b *9/02*
U.S. Cl. 356—106 R 17 Claims



1. Apparatus for measuring the position of a work table relative to a tool head having a tool axis extending substantially perpendicular to the work surface of the table comprising:

a first interferometer mounted on the head in the vicinity of the tool axis and having a measuring axis extending at least in part parallel to the work surface in a first coordinate direction along a first line intersecting the tool axis; a first reflector mounted on the work table and having a reflecting surface extending adjacent the work surface perpendicular to the first line and facing inwardly of the table toward the tool head;

a second interferometer also mounted on the tool head in the vicinity of the tool axis and having a measuring axis extending at least in part parallel to the work surface in a second coordinate direction along a second line intersecting the tool axis and perpendicular to the first line; and

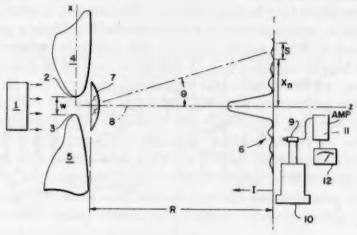
a second reflector mounted on the work table and having a reflecting surface extending adjacent the work surface perpendicular to the second line and facing inwardly of the table toward the tool head.

3,884,581

DIFFRACTOGRAPHIC AND OTHER SENSORS UTILIZING DIFFRACTION WAVES

Timothy R. Pryor, 5423 York Ln., Bethesda, Md. 20014

Continuation-in-part of Ser. No. 751,615, Aug. 9, 1968, Pat. No. 3,664,739. This application May 15, 1972, Ser. No. 253,421The portion of the term of this patent subsequent to May 23, 1989, has been disclaimed.
Int. Cl. G01b *9/02*
U.S. Cl. 356—109 57 Claims



1. A method of determining a change in the separation of first and second members, said first member including means for producing a first diffraction wave, said second member including means for producing a second diffraction wave, said second diffraction wave producing means being separated from said first diffraction wave producing means, said first and second diffraction wave producing means each comprising a single boundary or a plurality of single boundaries spaced in a direction transverse to the direction of electromagnetic waves directed thereonto, each of said single boundaries being capable of producing a single diffraction wave upon incidence thereon of said electromagnetic waves, said method comprising the steps of:

directing electromagnetic waves onto said first and second diffraction wave producing means to produce an interference pattern including fringes positioned about an axis in the direction of propogation of said electromagnetic waves, said interference pattern being produced by interaction between said first and second waves;

detecting changes in intensity of electromagnetic radiation with detection means located at a fixed distance from the axis of said interference pattern to detect a portion of said fringes of said interference pattern as the fringes move past said detection means; and

determining from said detected changes in intensity a change in separation between said first annd second diffraction wave producing means.

3,884,582

METHOD FOR PREDICTING DYEABILITY OF YARN

Robert Dewey Britt, Jr., Signal Mountain, and William Clair McCully, Hixson, both of Tenn., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Dec. 6, 1973, Ser. No. 422,612
Int. Cl. G01j *3/46*
U.S. Cl. 356—173 4 Claims

1. The method for predicting the dyeability with acid dyes of synthetic yarn melt spun from polyamide flake, said method comprising: obtaining a control polymer flake sample; obtaining a test polymer flake sample from flake to be spun into said synthetic yarn; dyeing said control and test flake samples in the same dye bath containing acid dye; comparing the dyeability of the test and control flake samples; predicting the dyeability of said synthetic yarn based on said comparing step; selecting a second control polymer flake having a dyeability significantly different from the control flake; dyeing a sample of the second control flake with the control and test flake samples; and comparing the dyeability of the control and

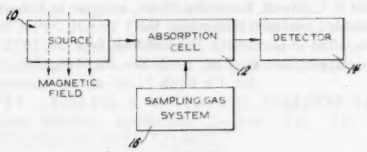
second control flake samples to subsequent dyeings to determine any change in the difference in dyeability between the control and second control flake samples as a check on the accuracy of said method for subsequent dyeings.

3,884,583

METHOD AND APPARATUS FOR MAGNETICALLY MODULATED RESONANCE ANALYSIS OF GAS

Tom T. Kikuchi, Santa Barbara, Calif., assignor to General Motors Corporation, Detroit, Mich.

Filed May 3, 1973, Ser. No. 357,017
Int. Cl. G01n *21/22, 21/34*
U.S. Cl. 356—201 **4 Claims**



1. A resonance absorption analyzer for measuring the concentration of a predetermined gaseous specie in a sample comprising

a line source of radiation fundamentally in resonance with the specie being measured including a quantity of gas of the predetermined specie and means for exciting the gas to produce radiation,

means for directing the radiation through the sample for partial absorption thereby,

means for detecting the radiation emitted from the sample, and means for producing second harmonic amplitude modulation of the emitted radiation including means for frequency modulating the source radiation for scanning the peak of the absorption curve of the specie being measured comprising means for establishing an AC magnetic field only across the source sufficient to produce modulated Zeeman splitting of the source radiation whereby second harmonic amplitude modulation of the emitted radiation occurs, the degree of amplitude modulation depending on the concentration of the predetermined specie in the sample.

3,884,584

AUTOMATIC SWITCHING SYSTEM FOR PHOTOMETRIC PORTIONS

Tokuichi Tsunekawa, and Takashi Uchiyama, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Nov. 19, 1973, Ser. No. 416,802
Claims priority, application Japan, Nov. 29, 1972, 47-119617
Int. Cl. G01j *1/16*
U.S. Cl. 356—226 **8 Claims**

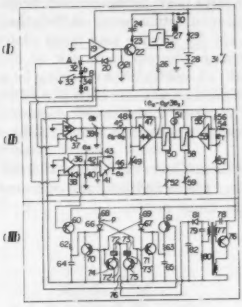
1. An automatic switching device of a photometry type in an automatic exposure control system of a camera comprising in combination;

a first photosensitive means formed to sense only the light flux mainly emitted from the central portion of a scene object, said means having at least one first photosensitive element of a photo-electromotive power type for generating photoelectric current by sensing said light flux,

a second photosensitive means formed to sense the light flux emitted from the peripheral portion of a scene object, said means having at least one photosensitive element of a photo-electromotive power type for generating photo-electric current by sensing said light flux,

a connecting means for coupling said first and said second elements in series with each other,

a control circuit means for coupling at the input thereof with said series-connected first and second elements, said circuit means having at least an amplifier circuit to form



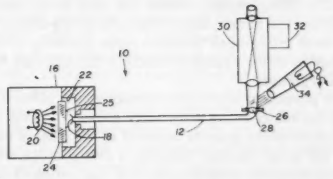
an output signal corresponding to the brightness of a scene object.

3,884,585

FIBER BREAK DETECTION METHODS FOR CABLES USING MULTI-FIBER OPTICAL BUNDLES

Robert L. Lebduska, La Mesa, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 25, 1974, Ser. No. 445,406
Int. Cl. G01n *21/16*
U.S. Cl. 356—239 **8 Claims**



1. A method of diagnostically assessing the breakage of individual fiber filaments in a composite fiber glass cable bundle comprising the steps of:

illuminating an input terminal end of said cable for transmission of the light therethrough to an output terminal end of said cable:

illuminating the surface of the output terminal end of the cable;

magnifying the face of the output terminal end of said cable;

whereby the integrity of light transmission through said cable can be assessed by determining the number of fiber filament ends which appear dark indicating the absence of transmitted light.

3,884,586

SAFETY LOCK LOOSE-LEAF RING BINDER MECHANISM

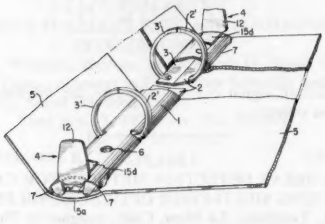
Jack H. Michaelis, Elmhurst, and Frank J. Malcik, Berwyn, both of Ill., assignors to Swingline, Inc., Long Island City, N.Y.

Filed Feb. 1, 1973, Ser. No. 328,783
Int. Cl. B42f *3/04*
U.S. Cl. 402—38 **6 Claims**

1. In a loose-leaf binding mechanism whcih includes an elongated spring case, a pair of relatively stiff but resilient elongated hinge plates pivotally mounted within the case, the outer longitudinal edge of each plate defining its pivot axis

with the inner longitudinal edges of the plate disposed in abutting relationship for all angular positions of the hinge plates, at least one prong on each hinge plate projecting externally of the case with each prong on one hinge plate being positioned in alignment with a prong on the other hinge plate, and actuator means for moving said hinge plates between a prong-closed position wherein each pair of aligned prongs form a substantially closed loop for retaining loose-leaf sheets and a prong-open position wherein each pair of aligned prongs are spread apart to permit insertion and removal of loose-leaf sheets, the improvement wherein the actuator means comprises:

a. a pivotally mounted lever member positioned in an opening in the hinge plates and pivotally-operated around the opening in the hinge plates;



b. hinge plate depressor means carried on said lever member for moving the hinge plates from said prong-open position to said prong-closed position upon pivoting of the lever member in one direction through a first predetermined arcuate segment of the path of movement of the lever member;

c. plate lifting means carried on said lever member for moving the hinge plates from said prong-closed position to said prong-open position upon pivoting of the lever member in the opposite direction through said first arcuate segment;

d. one portion of said lever member which portion includes lug elements being selectively movable along a second predetermined arcuate segment of the path of movement of the lever member between a first position where it is wedged tightly between the case and prong-closed hinge plates such that an imaginary line interconnecting any point of contact between said one portion and the case with any point of contact between said one portion and the hinge plates is oriented at an upwardly inclined outwardly extending attitude and a second position where it is wedged tightly between the case and prong-closed hinge plates such that said imaginary line is oriented at an upwardly inclined inwardly extending attitude, said second predetermined arcuate segment being adjacent to the said first arcuate segment and further being on the inward side of said first segment;

e. lock stop means capable of preventing pivotal movement of the lever member inwardly out of wedged-in engagement between the case and outwardly bowed hinge plates, said stop means including:

i. a stationary seating surface mounted on the case in the path of movement of said lever member which surface is along the centerline of the case and a substantial distance to either side of the centerline; and

ii. a retaining element mounted on said lever member for engagement along the centerline of the case and for engagement a substantial distance to either side thereof with said seating surface upon movement of said one portion of the lever member into said second wedged-in position; and

f. said case being transversely arched with the crown of the arch facing up and said one portion of the lever member including a transversely arched body conforming generally to the curvature of the case with its crown extending generally inwardly or upwardly depending on the angular position of the lever member, said body having a lower surface and a transversely arched upper surface conforming generally to the curvature of the case, said lug elements depending downwardly from the lower surface with one lug element positioned on one side of center and another lug element positioned on the other side of center with each lug element extending into engagement with one of said hinge plates, said upper surface engaging the case and the terminal ends of said lugs engaging the respective hinge plates at all wedged-in angular positions of said one portion of the lever member.

3,884,587

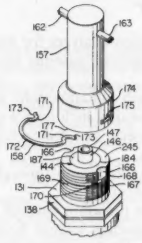
VALVE CONSTRUCTION AND IMPROVED PARTS FOR THE SAME OR THE LIKE

Edward N. Caldwell, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation-in-part of Ser. No. 290,558, Sept. 20, 1972. This application Oct. 10, 1973, Ser. No. 405,130

Int. Cl. F16b *21/07*

U.S. Cl. 403—14 **7 Claims**



1. In combination, a valve bonnet having opposed ends and an external peripheral surface intermediate said ends, said external peripheral surface having spaced arcuate locking recess means therein extending over the major arcuate portion of said peripheral surface, a cover member rotatably telescoped over said valve bonnet, and a spring retainer means carried by said cover member and having a portion thereof received in said recess means of said valve bonnet to detachably lock said cover member to said valve bonnet, said recess means and said portion of said cover member cooperating together in said locked condition thereof to permit rotational movement of said cover member through a relatively long arc relative to said valve bonnet.

3,884,588

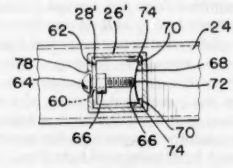
TUBE JOINING SYSTEM

Charles N. Apple, Sr., Greensboro, N.C., assignor to Metafab Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 132,362, April 8, 1971, abandoned. This application Oct. 5, 1972, Ser. No. 295,182

Int. Cl. F16b *9/00*

U.S. Cl. 403—194 **8 Claims**



1. A joint formed from a pair of members wherein the longitudinal axes of the members are out of alignment com-

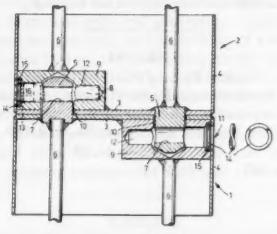
prising; a first elongated tubular member having an exterior surface with at least one opening provided therein, a stem member rigidly secured to said first tubular member, said stem member having a portion extending through said opening and deformed and compressed therein and in firm engagement with the inner portion of said first tubular member for firm and rigid attachment thereto, a second tubular member substantially encompassing said stem member and having an end portion in abutting relation with said first tubular member, said stem member having an expansible, flexible, and slidably releasable fastening means cooperatively retained therewith, and means connected to said stem member for urging said fastener means and said stem member into frictional gripping relation with the inner periphery of said second tubular member.

3,884,589

LOCKING JOINT FOR CONCRETE PILES HAVING JOINED SECTIONS

Per Liedholm, Solna, Sweden, assignor to Stabilator AB, Bromma, Sweden

Filed Feb. 6, 1973, Ser. No. 330,123
Claims priority, application Sweden, Feb. 22, 1972, 2184/72; Mar. 21, 1972, 72140/72
Int. Cl. E04b *1/48*
U.S. Cl. 403—316 **1 Claim**



1. A locking joint for joining first and second sections of a concrete pile comprising

a metal plate on the end of each pile section,

a metal collar extending from the metal plate on a first pile section around said pile section, said collar having an opening defined therein,

a locking block secured behind the metal plate of the first pile section, said locking block having a longitudinal pin receiving space defined therein and also a transverse bore defined therein intersecting the pin receiving space and aligned with the opening in said collar,

an outwardly projecting pin projecting from the metal plate of the second pile section and received in the pin receiving space in said locking block, said pin having a transverse hole therethrough,

a wedge device having a front end and a rear end and projecting through the transverse bore in said locking block and through the hole in said pin to hold the metal plates in firm abutting relationship,

a bulged portion constructed on the rear end of said wedge device and having toward its front an inwardly tapered portion and at its rear having a reduced cross section step, said locking block having defined therein a circumferentially extending groove around said bore adn adjacent said collar, and

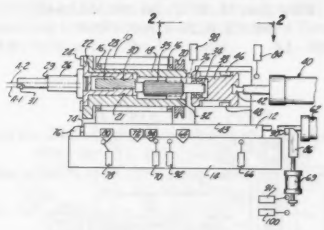
an annular resilient ring of wavy configuration about its periphery having an inner and an outer diameter, the outer diameter being greater than the diameter of the opening in said collar and the inner diameter being smaller than the diameter of the opening in said collar, said annular ring being accommodated in the groove in said locking block and being retained therein by said collar, certain raised portions about the periphery of said ring resiliently engaging said reduced cross section step on said wedge device in a direction longitudinally of the bore and positively retaining said wedge device under all conditions of stress in said bore.

3,884,590

ADJUSTABLE DUAL TOOL BORING BAR

Frank C. Skrentner, Bloomfield Hills, and Werner W. Willuweit, St. Clair Shores, both of Mich., assignors to F. Jos. Lamb Company, Warren, Mich.

Filed May 22, 1974, Ser. No. 472,077
Int. Cl. B23b *47/00*
U.S. Cl. 408—8 **14 Claims**



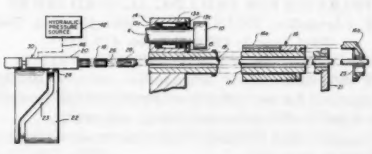
1. In a machine tool of the type comprising a support, a spindle journalled on said support for rotation about a fixed first axis, means for rotating said spindle, a tool holder mounted on said spindle and means associated therewith for rotative adjustment of said tool holder on said spindle about a second axis parallel to and spaced from said first axis, a pair of cutting tools mounted on said tool holder in circumferentially spaced relation, and a member movable in opposite directions and operatively connected with said rotative adjustment means for rotating said tool holder on said spindle about said second axis whereby to radially retract one tool and radially project the other tool relative to said first axis, that improvement which comprises, a pair of abutment means spaced apart in the path of movement of said movable member for limiting movement of said member in opposite directions and means for individually adjusting said abutment means to vary the locus of the opposite ends of the stroke of said member and thereby individually adjust the radially outermost position of each cutting tool.

3,884,591

AUTOMATIC HYDRAULIC TOOL SLIDE CAM ASSIST FOR A MACHINE TOOL

Francis W. Cook, Jr., Newington, Conn., assignor to Litton Industrial Products, Inc., New Britain, Conn.

Filed Sept. 17, 1973, Ser. No. 397,716
Int. Cl. B23b *47/22*
U.S. Cl. 408—11 **9 Claims**



1. In a machine tool for machining a plurality of workpieces associated therewith, the apparatus which comprises:

a. workpiece holding means and tool holding means;

b. a slide carrying one of said holding means, said slide being mounted for reciprocating rectilinear motion be-

tween a point proximate the other of said holding means and a point distal the other of said holding means;

c. cam means for controlling movement of said slide between said proximate and said distal position;

d. cam follower means responsive to the movement of said cam and operatively connected to said slide to urge said slide between said proximate and distal positions; and

e. means responsive to predetermined forces developed when the tool is in engagement with the workpiece urging said slide toward said proximate position to assist said cam in moving said slide toward said proximate position.

3,884,592

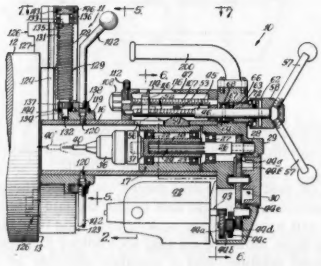
PORTABLE CENTER DRILL

Robert B. Shulters, P.O. Box 71, Batavia, Ill. 60510

Filed Jan. 15, 1973, Ser. No. 323,648

Int. Cl. B23b *41/00, 47/18*

U.S. Cl. 408—14 **9 Claims**



1. A portable center drill comprising a support member, retaining means carried by said support member for receiving and releasably retaining a drill bit or the like, drive means mounted on said support member and connected to said retaining means for rotating the same, chuck means carried by said support member and adapted to clamp onto a workpiece and to detachably secure said drill to said workpiece, said chuck means also being operable to precisely position said drill bit with respect to a drilling point on said workpiece, and feed means mounted on said support member for advancing said retaining means toward said chuck means and said drill bit into said workpiece, said support member, said drive means and said feed means being arranged in closely adjacent, side-by-side relation and said chuck means being arranged close to said drive means and said feed means, whereby the overall size and length of said drill is minimized and the bending moment imposed on said chuck means is reduced.

3,884,593

APPARATUS FOR DRILLING ALIGNED HOLES

Virgil F. Christoffer, 1603 S. Cooper, Arlington, Tex. 76010

Filed June 3, 1974, Ser. No. 475,825

Int. Cl. B23b *49/00*

U.S. Cl. 408—16 **10 Claims**

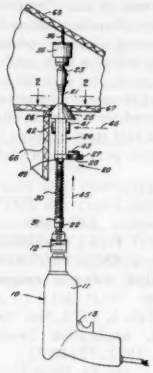
1. Apparatus for use with a portable power drill for drilling aligned holes in closely spaced panels, comprising:

an elongated shaft defining a drill bit extension having stop means at each end;

a housing rotatably and slidably mounted on said shaft for relative sliding and rotational movement;

an elongated coiled compression spring, disposed on said shaft, between said housing and the shaft stop means at the trailing end of the shaft, for continuously urging said housing along said shaft toward engagement with the shaft stop means at the leading end thereof;

at least one level indicator means mounted on said housing



to enable the drill operator to level said bit extension shaft in a selected orientation for drilling.

3,884,594

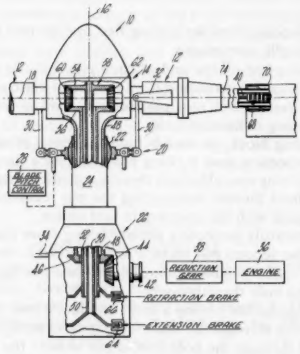
VARIABLE LENGTH BLADE

Evan Albern Fradenburgh, Fairfield, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 26, 1973, Ser. No. 428,480

Int. Cl. B64c *11/28*

U.S. Cl. 416—87 **24 Claims**



1. A variable length blade for aircraft comprising an inner blade portion and

an outer blade portion which telescopes with respect to said inner blade portion;

said inner blade portion including an external torque tube, and an internal torque tube;

means within said internal torque tube for telescoping said outer blade portion,

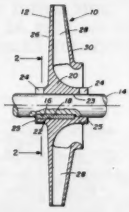
said internal torque tube being relatively fixed against rotation and translation;

and means associated with said external torque tube and said outer blade portion for changing the pitch of said outer blade portion.

3,884,595
IMPELLER AND SHAFT ASSEMBLY

David B. Herrick, Connersville, Ind., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 15, 1974, Ser. No. 469,999
Int. Cl. F01d 5/06
U.S. Cl. 416—198 6 Claims



1. An improved impeller and shaft assembly for use in centrifugal compressors or the like comprising:

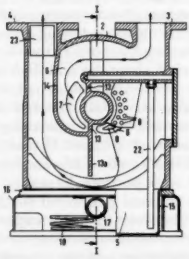
an elongated, generally cylindrical shaft; and,

an impeller located on and rotatable with said shaft, said impeller including a hub portion having first and second ends, a bore sized to closely receive said shaft and extending through said ends, a disk portion spaced axially inwardly from said ends and projecting radially outwardly from said hub portion, and a plurality of radially spaced slots in said hub portion extending axially inwardly from said ends toward said disk portion whereby the centrifugal or outward radial force generated by rotation of said assembly, which tends to enlarge said bore, causes a radially inwardly directed force on said hub portion adjacent said slots biasing said slotted end portions into tighter gripping engagement with said shaft.

3,884,596
DISTRIBUTOR WITH SEPARATE SUCTION AND PRESSURE NOZZLES FOR A LIQUID-RING GAS COMPRESSOR

Gunter Hoffmeister, Nurnberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 10, 1974, Ser. No. 459,582
Claims priority, application Germany, Apr. 12, 1973, 2318538
Int. Cl. F04c 19/00
U.S. Cl. 417—68 3 Claims



1. In a liquid-ring compressor for a pump medium having an operationally horizontal impeller shaft and a distributor having an outside wall separate suction and pressure nozzles and including at least one plane side wall containing one or more pressure slots and one or more suction slots adjoining a work chamber of the compressor and an enclosing outside wall and in which, below the pressure slots, the pressure nozzle, and the impeller shaft, a plenum is provided in the distributor for collecting liquids separated from the pump medium, with the pressure nozzle opening into the distributor at a point higher than the pressure slots, an improved distributor arrangement comprising:

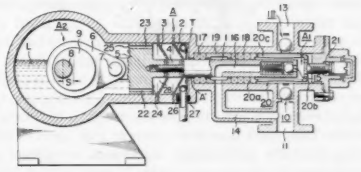
a. all pressure slots arranged on one side of the impeller shaft and the pressure nozzles on the other side, with the pressure nozzles and pressure slots connected directly with each other through the plenum located below both with the plenum extending across the entire cross-section of the distributor; and

b. suction and pressure nozzles opening into the distributor near its top and suction slots in the side wall arranged between first and second internal partitions with the pressure slots arranged between the first partition and the outside wall of the distributor with the first and second partitions connected below the impeller shaft to a wall extending toward the plenum and ending a distance from the bottom side of the distributor.

3,884,597
RECIPROCATING PUMP

Kazuichi Ito, 1463-4, Ichibu-cho, Ikoma-shi, Nara-ken, Japan

Filed Oct. 31, 1973, Ser. No. 411,410
Claims priority, application Japan, June 4, 1973, 48-61833
Int. Cl. F04b 49/00
U.S. Cl. 417—284 10 Claims



1. A reciprocating pump comprising:

a pump casing including a partition defining on one side thereof a cylinder chamber having an inlet port with an inlet valve and an outlet port with an outlet valve, and on the other side thereof a second chamber;

a plunger slidably supported in said casing;

a drive means mounted in said second chamber for driving said plunger in reciprocation;

a crosshead fixed to said plunger, and constituting a part of said plunger driving means;

a diaphragm including a central portion secured between said plunger and said crosshead, and with a peripheral portion secured to said casing, said diaphragm defining a closed space with said partition; and

a hollow elastic damping body disposed in said closed space between said diaphragm and said partition, said hollow elastic body extending through said casing and having an inner space which communicates with the ambient atmosphere.

3,884,598
PISTON ASSEMBLY FOR DIAPHRAGM PUMP

William F. Wanner, Minneapolis, Minn., assignor to Wanner Engineering, Inc., Hopkins, Minn.

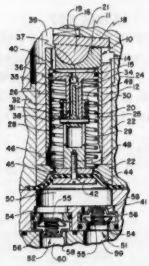
Filed Oct. 5, 1973, Ser. No. 403,937
Int. Cl. F04b 35/02
U.S. Cl. 417—386 14 Claims

1. A piston assembly for use in a diaphragm pump having a piston adapted for reciprocal movement from a first to a second position defining a power stroke and from said second to said first position defining a return stroke, a diaphragm movable between first and second positions, a pumping chamber on one side of said diaphragm, a transfer chamber on the

other side of said diaphragm having a volume defined, in part, by the relative positions of said piston and said diaphragm, a source of hydraulic fluid means forming on inlet for hydraulic fluid to said transfer chamber, said fluid in said transfer chamber serving to transfer motion of said piston to said diaphragm, and means for reciprocating the piston, said piston assembly comprising:

bias means movable with said piston for continuously biasing said diaphragm toward said piston;

diaphragm stop means for limiting the movement of said diaphragm away from said pumping chamber, and defining the first position of said diaphragm when said diaphragm is in contact therewith;



valve means responsive to relative movement between said diaphragm and said piston for controlling the flow of hydraulic fluid from said hydraulic fluid source into said transfer chamber such that said valve means is closed whenever the pressure in said transfer chamber is greater than the pressure in said hydraulic fluid source and such that said valve means is open whenever the pressure in said transfer chamber is less than the pressure in said hydraulic fluid source and the volume of said transfer chamber is less than the volume thereof when each of said piston and said diaphragm is in its first position.

3,884,599

SCROLL-TYPE POSITIVE FLUID DISPLACEMENT APPARATUS

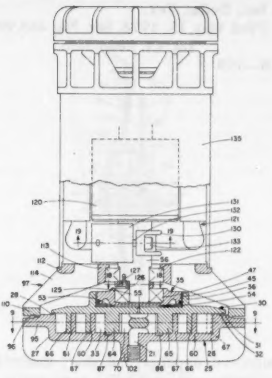
Niels O. Young, Mason, N.H., and John E. McCullough, Carlisle, Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed June 11, 1973, Ser. No. 368,907

Int. Cl. F01c *1/02*

U.S. Cl. 418—55 **58 Claims**

1. In a positive fluid displacement apparatus into which a fluid is introduced through an inlet port for circulation therethrough and subsequently withdrawn through a discharge port, and in which two scroll members having wraps which make moving line contacts to seal off and define at least one moving pocket of variable volume and zones of different fluid pressure when one of said scroll members is driven to orbit said other scroll member while maintaining a fixed angular relationship therewith, the improvement comprising driving means including means to provide a centripetal radial force adapted to oppose a fraction of the centrifugal force acting upon said other orbiting scroll member, whereby the radial



sealing force between said scroll member is maintained at a level to minimize both wear and internal fluid leakage.

3,884,600

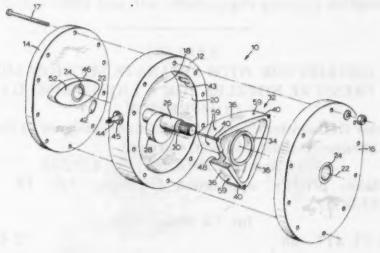
GUIDANCE MEANS FOR A ROTARY ENGINE OR PUMP

Herbert Lewis Gray, Milton, Ontario, Canada, assignor to Gray & Bensley Research Corporation, Milton, Ontario, Canada

Filed Nov. 8, 1973, Ser. No. 414,000

Int. Cl. F01c *1/02*; **F04c** *17/02*; **F02b** *55/00*

U.S. Cl. 418—61 A **6 Claims**



1. A rotary mechanism comprising a body, a shaft mounted by the body for rotation about a corresponding axis, the body providing an internal chamber having an internal peripheral surface of two-lobed epitrochoidal cross-section perpendicular to and symmetrical about the said shaft axis, a three-lobed rotor of triangular cross-section mounted within the chamber for rotation about an axis displaced from and parallel to the said shaft axis, eccentric means connecting the shaft and the rotor for transmission of rotation between them, the rotor being symmetrical about its own axis and having three circumferentially-spaced apex portions in sealing engagement with the said chamber internal peripheral surface to form three working chambers between the rotor external peripheral surface and the chamber surface that vary in volume upon relative rotation of the rotor and the chamber, and guidance means for guiding the rotor in the required motion relative to the casing comprising a first essentially triangular guide surface movable with the rotor, symmetric about the rotor axis, and parallel to the rotor axis and a second guide surface movable with the body, symmetric about the shaft axis, and parallel to the shaft axis, the guide surfaces being in relatively-sliding engagement with one another, the said second surface being of the oval shape generated by the said first surface in

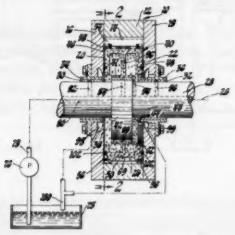
their required relative motion and having its major and minor axes parallel respectively to the minor and major axes of the internal body surface.

3,884,601

ROTARY ENGINE ROTOR SEAL LUBRICATION

Parme G. Anthony, Centerville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 24, 1973, Ser. No. 400,365
Int. Cl. F04c *29/02*
U.S. Cl. 418—90 **2 Claims**



1. A rotary engine comprising an engine housing having an internal peripheral wall and oppositely facing side walls cooperatively defining a cavity, a shaft extending through said cavity and side walls and rotatably supported by said housing, a hollow powdered metal rotor located in said cavity and rotatably mounted on said shaft, said rotor having a circumferentially extending wall cooperating with said peripheral wall of said housing and oppositely facing radially extending side walls cooperating with said side walls of said housing to provide a plurality of chambers that are spaced about and move with said rotor while varying in volume as said rotor and said shaft rotate, said rotor having apex seals engaging said peripheral wall and side seals engaging said side walls to seal said chambers from each other, a source of oil, passage means for delivering the oil to and from the interior of said rotor, and said circumferentially extending wall and radially extending side walls of said rotor constructed of a metal having a porosity over the entire thickness thereof effective to permit oil to diffuse from the interior to the exterior of said rotor as the result of centrifugal forces on the body of oil within said rotor at a rate providing sufficient oil delivery to the exterior of said rotor to be flung outward by rotor rotation against said peripheral wall to adequately lubricate said apex seals at minimum rotor speed and load and as a result of continuing centrifuging action of the oil in the interior of said rotor providing increasing oil delivery to the exterior to increase the lubrication of all said seals with increasing rotor speed at an exponential rate.

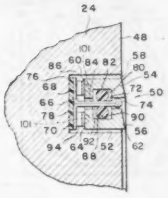
3,884,602

ROTARY ENGINE OIL SEAL ASSEMBLY

Ronald L. Phillips, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 11, 1974, Ser. No. 432,447
Int. Cl. F01c *19/00*
U.S. Cl. 418—142 **3 Claims**

1. In a rotary engine having a housing with an inwardly facing peripheral wall and oppositely facing inner side walls cooperatively defining a cavity, a crankshaft rotatably supported in said housing, said crankshaft having an eccentric located in said cavity, a rotor rotatably mounted on said eccentric in said cavity, said rotor having sides facing said side walls and peripheral faces facing said peripheral wall defining a plurality of chambers that are spaced about and move with said rotor while varying in volume as said rotor rotates, an annular seal groove in each side of said rotor with its center on the rotor axis, the improvement comprising; a seal assembly comprising in combination an annular supporting member having a T-shaped cross section including a horizontally disposed cylinder and vertically disposed radial flanges extending radially outwardly and radially inwardly of the cylinder, a first sealing ring positioned radially outwardly of the cylinder of said annular member and containing a substantially centrally located groove facing said cylinder, an O-ring seal disposed in said groove engaging said cylinder of said annular member, a first annular wave spring engaging a portion of said flange extending radially outward of said cylinder of said annular member and engaging said first sealing ring biasing it outwardly in said rotor annular groove, a second annular sealing ring disposed in said rotor groove radially inwardly of said



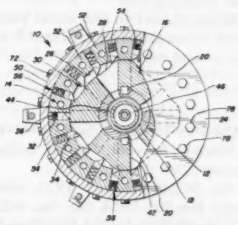
cylinder and containing a groove facing said cylinder, a second O-ring seal in said groove engaging said second sealing ring and said cylinder of said annular member, a second annular wave spring engaging a portion of said flange extending radially inwardly of said cylinder of said annular support member and engaging said second sealing ring biasing it outwardly in said rotor annular groove, an elastomeric annular seal member bonded to the back side of said flanges of said annular supporting member, and a detent member on the terminal end of said annular support member cylinder retaining said O-rings and thereby said seal rings and said wave biasing springs in assembled relationship whereby said seal assembly can be inserted within the circular rotor seal groove as an assembled unit.

3,884,603

FLUID TRANSLATING DEVICE WITH IMPROVED VANE SUPPORT

Birger F. Jansson, Racine, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed July 30, 1973, Ser. No. 384,106
Int. Cl. F04c *1/00*
U.S. Cl. 418—177 **5 Claims**



1. In a fluid translating device of the sliding vane type having a fixed element with fluid flow paths in said fixed element and a rotating element surrounding said fixed element and cooperating therewith to define a chamber, said rotating element including a vane supporting member comprising an annular ring; a plurality of circumferentially spaced segments inside said ring, and an equal number of spacers between adjacent segments and cooperating therewith to define vane receiving slots, characterized by at least one of said spacers

being wedge means movable axially of said ring to place said segments under compression and said ring in tension.

3,884,604

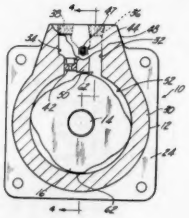
CONTROL VALVE

Robert J. Smith, Birmingham, Mich., assignor to Planet Corporation, Troy, Mich.

Filed Jan. 2, 1974, Ser. No. 430,218

Int. Cl. F15b *15/22;* **F01c** *21/00;* **F03c** *3/00*

U.S. Cl. 418—270 **4 Claims**



1. A valve assembly for controlling the acceleration and deceleration rates of a fluid motor comprising:

rotary mechanical force input means mechanically connected to said motor;

a fluid inlet passage in communication with a source of pressurized fluid;

a fluid outlet passage in communication with the inlet port of said motor;

a first valve means situated between said inlet passage and said outlet passage and capable of varying the pressure drop between said passages in response to changes in the rotary position of said force input means, said first valve means comprising a valve body having a central bore formed therethrough, said fluid inlet passage and said fluid outlet passage fluidly communicating with said central bore through the periphery of said central bore, and a cam member disposed in said central bore and secured for rotation to said force input means, said cam member employing one or more lobes which register with the periphery of said central bore for selectively communicating said inlet passage to said outlet passage in dependence on the rotational position of said cam member,

second valve means situated between said inlet and outlet passages and capable of limiting the pressure differential between said passages; and

flow control means situated in said outlet passage intermediate the point of communication of said first valve means and the inlet of said motor.

3,884,605

MANUFACTURE OF SOAP BARS

Pierre Grelon, Marq-en-Baroeul, France, assignor to Lever Brothers Company, New York, N.Y.

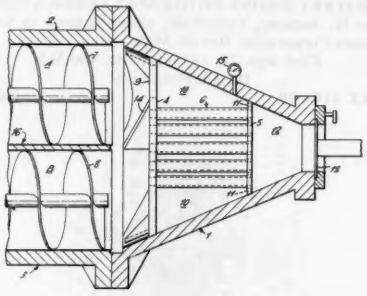
Division of Ser. No. 303,176, Nov. 2, 1972, abandoned. This application Feb. 15, 1974, Ser. No. 442,692

Claims priority, application United Kingdom, Nov. 5, 1971, 51476/71

Int. Cl. B29f *3/12*

U.S. Cl. 425—131.1 **5 Claims**

1. An apparatus for the continuous preparation of multicolored detergent bar which comprises a twin-barrel soap plodder comprising at least one set of two parallel barrels, having a partition wall in between for the provision of two separated streams of soap mass, a cone attached to the barrel-twin outlets and two parallel plates positioned in the cone after the worm compressors, each plate having two groups of apertures, one group being connected by a system of tubes through which the soap mass emerging from one barrel passes,



the second group of apertures functioning as outlets for the soap mass emerging from the second barrel.

3,884,606

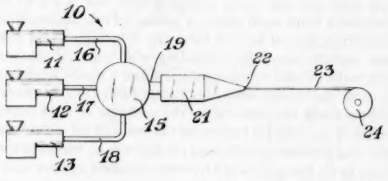
APPARATUS FOR MULTILAYER COEXTRUSION OF SHEET OR FILM

Walter J. Schrenk, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 185,534, Oct. 1, 1971, Pat. No. 3,773,882. This application June 12, 1973, Ser. No. 369,372

Int. Cl. B29f *3/12*

U.S. Cl. 425—133.5 **3 Claims**



1. An apparatus for the preparation of a multilayer film or sheet, the apparatus comprising

a body, the body defining at least

a first polymer entrance passage,

a first plenum in communication with the first polymer passage,

a stream dividing means to divide material flowing from the first passage into a plurality of first substreams,

second polymer receiving means in operative communication with a second plenum, the second plenum discharging to the dividing means which divides the second stream into a plurality of second substreams and interdigitates the plurality of second substreams with the first substreams, the dividing means being in operative communication with

a third or composite stream receiving plenum, the composite stream comprising the combined first and second substreams,

a third plenum discharge passage in operative communication with the third plenum and adapted to receive the composite stream from the third plenum, the discharge means being in combination with

a die having a generally slot-like extrusion orifice, the discharge passage having

a first or receiving end and

a second or discharge end, the improvement which comprises

disposing the discharge portion of the stream dividing means in an arcuate manner to form an arc of a circle wherein the discharge portion is generally equidistant from the discharge end of the third plenum discharge passage.

3,884,607

PLASTICIZING EXTRUSION DEVICE EMPLOYING WORMS

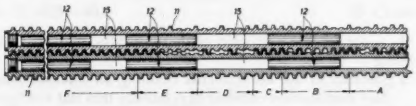
Bernhard Gerhards, Mausbach Uber Stolberg, Rhineland, Germany, assignor to Kleinewefers Industrie-Companie GmbH, Krefeld, Germany

Filed Jan. 15, 1974, Ser. No. 433,531

Claims priority, application Austria, Jan. 16, 1973, 342/73

Int. Cl. B29c *3/06*

U.S. Cl. 425—144 **11 Claims**



1. In a plasticizing worm extruder; a housing, a pair of elongated parallel and rotatable worms in said housing having interengaged helical rib means thereon, feed opening means in said housing for supplying material to be plasticized and extruded to said worms near one end thereof and discharge opening means in said housing for the extrusion of the plasticized material from near the other end of said worms, means in said worms for heating axial regions thereof to respective temperatures, at least one of said regions being heated to the plasticizing temperature of said material, each said worm having the radially outer ends of at least a portion of the said rib means thereon disposed close to the housing and each worm having at least one axial zone wherein the said rib means is reduced in at least the height thereof to increase the space to receive said material.

3,884,608

INJECTION MOLDING MACHINE WITH SHOT SIZE REGULATION

Earl H. King, Cygnet, Ohio, assignor to Sund-Borg Machines Corporation, Fremont, Ohio

Continuation of Ser. No. 116,789, Feb. 19, 1971, abandoned. This application Mar. 1, 1973, Ser. No. 337,092

Int. Cl. B29f *1/04*

U.S. Cl. 425—145 **10 Claims**

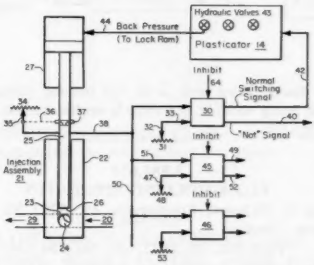
1. A rotary injection molding machine including a plasticator unit, a plurality of molds for displacement along a path into a work position adjacent the plasticator, an injection assembly including an accumulator chamber, a reciprocable member positioned at least partially in the chamber, means for regulating movement of said member within the accumulator chamber, a valve effective in a first position to complete a passage between the accumulator chamber and an input channel through which molten plastic is received from the plasticator, and effective in a second position to complete a passage between the accumulator chamber and output channel for discharging the accumulated plastic toward the mold, and first and second control systems for regulating the amount of plastic accumulated and discharged into first and second molds by regulating displacement of said member; said first control system comprising:

a comparator circuit having first and second input connections and an output connection for providing a control signal responsive to equality between signals received at the input connections,

a first potentiometer coupled to a first input connection of the comparator circuit for presetting a reference signal indicating the desired quantity of plastic to be accumulated and discharged to the first mold,

a second potentiometer electrically coupled to the second input connection of the comparator circuit and mechanically coupled for operation as a function of displacement of said member to provide a position signal that varies as a function of the position of the member, and

switching means connected for operation by the control signal to termina' displacement of said member when the desired quantity of plastic material is present in the accumulator chamber;



and said second control system comprising:

a comparator circuit having first and second input connections and an output connection for providing a control signal responsive to equality between signals received at the input connections,

a first potentiometer coupled to a first input connection of the comparator circuit for presetting a reference signal indicating the desired quantity of plastic to be accumulated and discharged to the second mold,

means for coupling the second input connection of the comparator circuit to said second potentiometer which provides the position signal as a function of the displacement of said member; and

switching means connected for operation by the lastmentioned control signal to terminate displacement of said member when the desired quantity of plastic material for the second mold is present in the accumulator chamber.

3,884,609

PLASTIC BLOW MOLDING MACHINE

George C. Britten, Westbury, N.Y., assignor to Manbritt Industries, Inc., Amityville, N.Y.

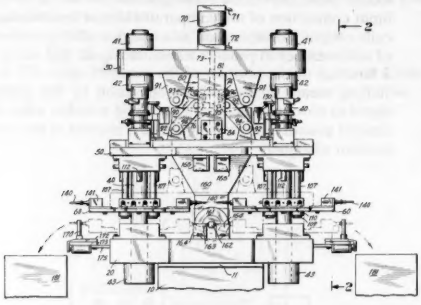
Filed May 30, 1973, Ser. No. 365,171

Int. Cl. B29d *23/03*

U.S. Cl. 425—242 B **28 Claims**

1. Blow molding machine for forming hollow plastic articles, comprising a fixed platen, an opposite end plate, and a vertically slidable movable platen, a pair of tie rods passing through the end portions of all the foregoing and being rigidly secured to the fixed platen and the end plate and passing

through the movable platen which has slidable fit thereon, and at least one turntable mounted between the movable platen



and the fixed platen with a tie rod passing through it, the turntable being slidable and rotable on the tie rod.

3,884,610

BLOW-MOLDING APPARATUS

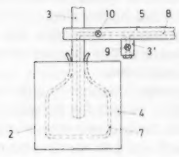
Johannes S. Mehnert, Ernststrasse 11, 5205 St. Augustin-Menden, Germany

Filed Feb. 20, 1973, Ser. No. 334,134

Claims priority, application Germany, Feb. 22, 1972, 2208165

Int. Cl. B29c *5/06*

U.S. Cl. 425—387 B **6 Claims**



1. Blow-molding apparatus for the fabrication of a hollow body of thermoplastic material within a blow mold, the body being subsequently released from the mold, comprising:

a. a conventional blow pipe (**3**) capable of providing a first stream of gas,

b. a guide (**5**) for selectively implanting the blow pipe into the mold and extracting the blow pipe from the mold before the body is released from the mold,

c. a gas-supplying member of simple construction (**3'**) mounted on the guide and separate from the blow pipe, the member being capable of supplying a second stream of gas to the mold after the removal of the blow pipe, the guide serving to move the said member into and out of the mold, and

d. a valve system (**9, 10**) for selectively directing gas to the blow pipe (**3**) and the member (**3'**), the blow pipe expanding the body of thermoplastic within the mold and the gas-supplying member maintaining a positive gas pressure within the body while it is allowed to cool.

3,884,611

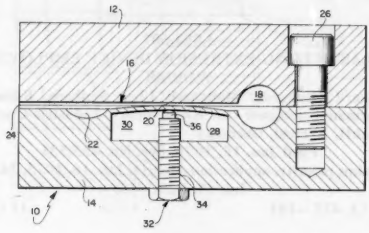
EXTRUSION DIE

John W. Anderson; John J. Barney; James J. Flanagan, and Vernon Krupa, all of Chippewa Falls, Wis., assignors to Leesona Corporation, Warwick, R.I.

Filed Oct. 24, 1973, Ser. No. 409,305

Int. Cl. B29f *3/00*

U.S. Cl. 425—376 **11 Claims**



1. A die for the extrusion of thermoplastic materials comprising

a plurality of die components defining an internal plastic flow distribution channel of relatively thin flat configuration, said channel being upstream and removed from the exit portion of said die,

one of said die components having an integral segment thereof adjacent said channel and in part defining said channel so as to insure a smooth uninterrupted flow path, said segment deformable so as to modify the cross-sectional configuration of said channel upstream of said exit portion a distance to produce significant thermoplastic material flow control effective at said exit portion and means for deforming said segment.

3,884,612

APPARATUS FOR BENDING THERMOPLASTIC PIPES

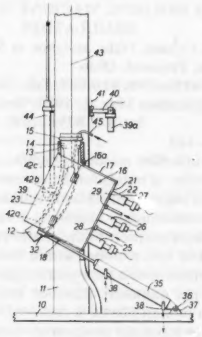
Gunnar Parmann, Kongsmyrvn 28b, 5070 Mathopen, Norway

Filed Jan. 4, 1973, Ser. No. 321,028

Claims priority, application Norway, Jan. 12, 1972, 48/72

Int. Cl. B29c *17/02*

U.S. Cl. 425—384 **23 Claims**



1. Apparatus for bending thermoplastic pipes which is capable of functioning as a self-contained unit and which comprises

heat-transfer means for controllably heating and cooling such a pipe,

means for locating one end of the pipe in a fixed position externally of said heat-transfer means,

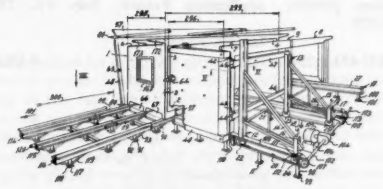
means for internally reinforcing the pipe including an inflatable container adapted to be lowered into the pipe and to be inflated to a pressure sufficient to cause said container to abut the pipe so as to provide a reinforcement therefor while suspended therein and means for lowering and raising said container into and out of the pipe when said container is in its normal deflated condition, and means for applying a bending force to said pipe while said pipe is received in said heat-transfer means with said one end in said fixed position, the heat-transfer means being adapted to pivot as the pipe is being bent by actuation of the bending force-applying means.

3,884,613

APPARATUS FOR FORMING AND DISPLACING A PREFABRICATED BUILDING SECTION

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Division of Ser. No. 882,647, Dec. 5, 1969, Pat. No. 3,652,052.
This application Mar. 24, 1972, Ser. No. 237,991
Claims priority, application Netherlands, Dec. 10, 1968, 6817718
Int. Cl. B28b *7/22*
U.S. Cl. 425—404 **29 Claims**



1. A device for molding a prefabricated section configured to form and enclose a part of a building, said device comprising jig means to form a mold in which said section is cast, said jig means having displaceable outer side jigs and at least one displaceable inner jig whereby said section is releasable from said jig means, supporting structure provided for said inner jig adapted to move said inner jig in a first horizontal direction, displacement means to displace said outer side jigs also in said first direction, said jig means including a supporting member at the lower side to support the said section, said device including a conveyor to displace in a horizontal direction substantially perpendicular to said first mentioned direction said section over the supporting member and out of the mold defined by said jig means.

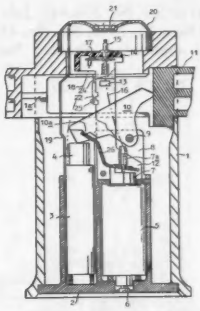
3,884,614

GAS LIGHTER

Nobuyoshi Moriya, Omiya, Japan, assignor to Mansei Kogyo Kabushiki Kaishya, Kawaguchi-Shi, Saitama, Japan

Filed May 22, 1974, Ser. No. 472,130
Int. Cl. F23q *2/38*
U.S. Cl. 431—88 **10 Claims**

1. In a gas lighter having a casing, a support means disposed within the casing, a fuel reservoir provided with a fuel refill valve, a high voltage generating device mounted on the support means, and a pair of discharge electrodes electrically connected to the high and low voltage sides, respectively of the high voltage generating device and forming a spark gap therebetween, means to preclude undesired spark discharge across said spark gap when said lighter is in inverted position, comprising a conducting metal plate disposed between the spark gap and the high voltage generating device and electrically connected to the high voltage side thereof, and a contact means mounted on the support means and displaceable into



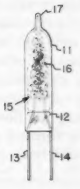
electrical contact with said metal plate to parallel said spark gap and short-circuit the electric ignition circuit.

3,884,615

FLASH LAMP MOUNT CONSTRUCTION

John C. Sobieski, Russell Twp., Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 21, 1974, Ser. No. 453,487
Int. Cl. F21k *5/02*
U.S. Cl. 431—95 **15 Claims**



1. A photoflash lamp of the type having a bulb and a mount comprising a pair of inleads extending within the bulb and having flash ignition means connected across said inleads within said bulb, said bulb containing combustible material ignitable by said flash ignition means, wherein said flash ignition means comprises an electrically insulative member, said inleads extending into said insulative member, an opening through said insulative member between and in communication with both of said inleads, said opening having ends thereof at different locations on the surface of said insulative member and communicating with the interior of said bulb, at each of said ends, and primer material contained in said opening and connected electrically across said inleads said primer material being exposed to said interior of the bulb at both said ends of said opening.

3,884,616
LIGHTER WITH HEAD ROTATABLE FOR FLAME ADJUSTMENT

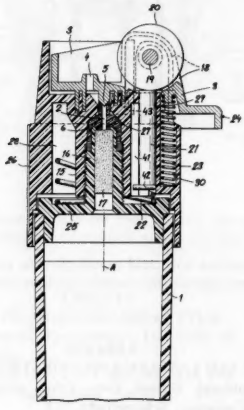
Guy Neyret, Francheville, France, assignor to Etablissements Genoud & Cie Societe Anonyme, Venissieux (Rhone), France

Continuation-in-part of Ser. No. 376,446, July 5, 1973. This application Nov. 26, 1973, Ser. No. 418,823

Claims priority, application France, Nov. 27, 1972, 72.42707

Int. Cl. F23q *2/00*

U.S. Cl. 431—142 **6 Claims**



1. A lighter comprising:
a body having a gas reservoir;
a head mounted on and rotatable relative to said body about an axis passing through said body, said head being formed with a passage generally parallel to said axis and opening away from said body;
a flint axially displaceable in said passage; and
a compression spring received in said head concentrically to said axis and having one end bearing against said body, said flint bearing against the other end of said spring, said body being generally cylindrical and centered on said axis, said head having valve means operatively connected to said body for limiting gas flow therefrom through said head, said head being formed with an annular circular groove open toward said body and receiving said spring.

3,884,617
FLUIDISED BED HEATER

Michael John Virr, Stourbridge, England, assignor to Fluidfire Development Limited, Dudley, England

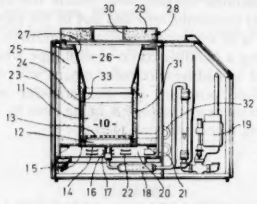
Filed July 27, 1973, Ser. No. 383,248

Claims priority, application United Kingdom, July 29, 1972, 35561/72

Int. Cl. F23d *19/02*

U.S. Cl. 431—170 **10 Claims**

1. In a heater comprising a bed of refractory particles, inlet means for admitting gases to the bed and feed means for feeding a gaseous fuel and air into the bed through the inlet means at a rate such as to fluidise the bed, the improvement wherein the feed means includes means for mixing a gaseous fuel and air and for feeding of mixture of fuel and air to the inlet means, the feed means further including a passageway communicating with said mixing means and with said inlet means, and cooling means comprising a coolant duct in thermal communication with the gaseous mixture which flows through the passageway and the inlet means when the heater is in use, and means for causing a fluid coolant to flow through



said coolant ducts, whereby heat can be extracted from said gaseous mixture.

3,884,618
GAS LIGHTERS

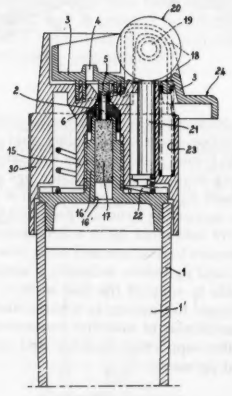
Guy Neyret, Francheville, France, assignor to Establissements Genoud & Cie, Venissieux (Rhone), France

Filed July 5, 1973, Ser. No. 376,446

Claims priority, application France, July 10, 1972, 72.25377

Int. Cl. F23q *1/04*

U.S. Cl. 431—254 **4 Claims**



1. A lighter comprising:
a hollow cylindrical body defining a gas reservoir and having an axial passage;
a head rotatably mounted on said body and having means for varying the flow cross-section of said passage upon such rotation;
a lever pivotably mounted on said head and formed with valve means in axial alignment with said passage for selectively opening and closing same;
a burner aperture formed in said lever and laterally offset from said valve means;
sealing means between said burner aperture and said passageway; and
ignition means on said head for the ignition of gas emanating from said burner aperture.

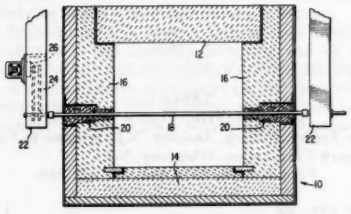
3,884,619
METHOD FOR FAST FIRING GLAZED CERAMIC TILE TRIM PIECES

John A. Cable; Stephen J. Cable, and Richard R. Falbo, all of Canton, Ohio, assignors to United States Ceramic Tile Company, Canton, Ohio

Continuation-in-part of Ser. No. 397,732, Sept. 17, 1973, Pat. No. 3,830,625. This application Apr. 26, 1974, Ser. No. 464,471

Int. Cl. F27b *9/30*

U.S. Cl. 432—2 **12 Claims**



1. A method for removing glaze and other deposits from the rollers of a roller hearth kiln without cooling the kiln, the kiln being of the type which includes power driven rollers for receiving and transporting ceramic tile through the kiln, such method including raising the temperature of said kiln to a temperature which is higher than the temperature used for firing the glazed ceramic tile to decrease the molten viscosity of the glaze deposits on said rollers and subsequently introducing absorbent refractory material onto said rollers while driving said rollers to pass said refractory material over said rollers through the heated kiln after the viscosity of the glaze deposits is decreased to cause the glaze deposits to transfer from the rollers to said absorbent refractory material.

9. A method for removing glaze and other deposits from the power driven rollers of a roller hearth kiln which occur from the firing of glazed ceramic tile in the kiln without cooling the kiln which includes driving the rollers of the kiln, introducing absorbent cleaning refractory shapes having a low thermal expansion characteristic and a high absorption characteristic onto said rollers to be passed by said driven rollers through the heated kiln causing the glaze deposits on said rollers to transfer to said absorbent cleaning refractory shapes.

3,884,620
PROCESS AND APPARATUS FOR CONTINUOUSLY HEATING FINE-GRAINED COAL

Roland Rammler, Konigstein, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt, Germany

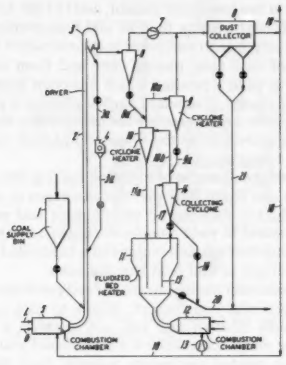
Filed Oct. 10, 1973, Ser. No. 405,233

Claims priority, application Germany, Nov. 17, 1972, 2256385

Int. Cl. F27b *15/00;* **F26b** *3/08*

U.S. Cl. 432—15 **10 Claims**

1. Process for continuously heating fine-grained coal to a controlled, uniform end temperature by direct contact with hot gases which comprises conveying the coal to be heated to elevated cyclonic zone and subsequently to one or more cyclonic heat exchange zones disposed on a lower level or on successively lower levels, the temperature of the coal being raised in said heat exchange zones, thereafter heating the coal to said end temperature in a fluidized-bed heating zone, the exhaust gas from the fluidized-bed heating zone being supplied to a separate cyclonic collecting zone where dust is collected from the exhaust gas, said gas being then passed as a hot conveying gas through said one or more heat exchange



zones, said dust collected in the collecting zone being withdrawn or recycled to the fluidized bed zone.

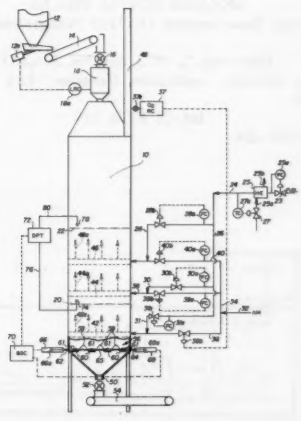
3,884,621
CONTROL OF VERTICAL HEAT TREATING VESSELS

James R. Summer, Blum, Tex., assignor to Round Rock Lime Company, Blum, Tex.

Continuation-in-part of Ser. No. 383,484, July 30, 1973. This application May 6, 1974, Ser. No. 467,139

Int. Cl. F27b *1/26*

U.S. Cl. 432—19 **13 Claims**



1. In a process for heat treating particulate material of nonuniform gradation in a vertical vessel wherein the particulate material is passed to the inlet of the vertical vessel and allowed to gravitate through a heat treating zone in the vessel wherein it is contacted with upwardly moving heat treating fluid comprising oxygen and fuel which is passed through said heat treating zone and then through the gas outlet of said vessel at the upper end thereof, and the difference in pressure between said fluid passing to said heat treating zone and said

fluid passing from said heat treating zone is measured to determine the relative bulk density of said particulate material passing through said heat treating zone and at least one of (a) the flow rate of particulate material from the outlet of said vertical vessel at the lower end thereof, and (b) the heat input carried by said heat treating fluid to said heat treating zone, is regulated in response to variations in the measured differential pressure of said fluid passing into and from said heat treating zone to yield a product which has been heat treated equivalent to a charge of standard particles having a predetermined bulk density, and thereafter the heat treated material is removed from said outlet at the lower end of said vessel, the improvement comprising:

sensing the oxygen content of said fluid passing through said gas outlet and controlling the flow of oxygen to said heat treating fluid in response to variations of said measured oxygen content to yield a uniform oxygen content in said fluid passing through said outlet and a controlled oxygen-fuel conversion in said heat treating zone.

10. In a vertical kiln having means to feed particulate material to its upper inlet end thereof; means to pass a fuel/air mixture upwardly through said kiln and establish a burning zone within the midportion thereof; and an outlet grate means to remove heat treated particulate material from the lower outlet end thereof at a controlled rate in response to variations of the bulk density of said particulate material passing through said burning zone to yield a product which has been heat treated equivalent to a charge of standard particles having a predetermined bulk density; the improvement comprising:

means for sensing the oxygen content of gases passing from said burning zone, and means for controlling the quantity of air introduced into said fuel-air mixture in response to fluctuations in said oxygen content.

3,884,622

METHOD AND APPARATUS FOR POLYMERIZING MOLDED DENTAL PIECES

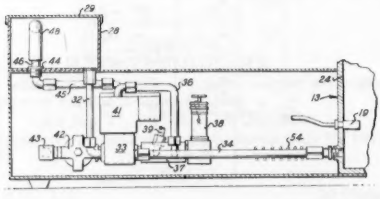
Erich Kopp, Panoramaweg 15, 7293 Pfalzgrafenweiler, Germany

Filed Aug. 7, 1973, Ser. No. 386,483

Claims priority, application Germany, Oct. 17, 1972, 2250819

Int. Cl. F27b *5/04*

U.S. Cl. 432—24 **35 Claims**



1. An apparatus useful for the matrix free polymerization of molded dental pieces comprising:

a. a hermetically sealable polymerization chamber,

b. means for raising the pressure within the chamber after it has been hermetically sealed,

c. means for elevating the temperature within the chamber,

d. means for supplying a sufficient amount of water in the polymerization chamber to form an unsaturated water vapor atmosphere in the chamber after it has been hermetically sealed under increased temperature and pressure,

e. means for exhausting the chamber after effecting polymerization for a predetermined amount of time while the chamber remains hermetically sealed, and

f. means for providing a flow of fluid into and out of the chamber after it has been hermetically sealed.

33. A method as defined in claim **32** wherein said water is supplied in the polymerization chamber before the chamber has been hermetically sealed.

3,884,623

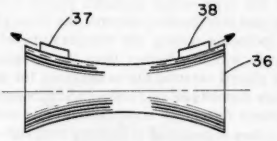
XEROGRAPHIC FUSER ROLLER

William Frederick Slack, Andover, N.J., assignor to Van Dyk Research Corporation, Whippany, N.J.

Filed Feb. 16, 1973, Ser. No. 333,289

Int. Cl. G03g *5/00*

U.S. Cl. 432—60 **1 Claim**



1. Xerographic fusing apparatus, comprising:

a relatively rigid generally concave hollow cylindrical fuser roller mounted for rotation about the longitudinal axis thereof, the diameter of said roller being linearly and symmetrically tapered along said axis with respect to the center thereof, from a maximum value at each end to a minimum value at the center, said fuser roller comprising a metal cylinder having an outer layer comprising polytetrafluoroethylene disposed thereon;

a radiant heating element disposed along said longitudinal axis within the interior of said fuser roller for heating said fuser roller to a desired xerographic toner fusing temperature;

a cylindrical pressure roller comprising a metal core surrounded by a cylinder comprising elastomeric material, and an outer layer comprising polytetrafluoroethylene disposed thereon, said pressure roller being disposed in juxtaposition with said fuser roller, said pressure roller being mounted for rotation about the longitudinal axis thereof,

said longitudinal axes being mutually parallel and spaced apart a given distance such that the peripheries of said rollers engage each other along the entire length of the line of contact thereof,

said fuser roller having a taper from the center to each end thereof such that the diameter of said fuser roller increases on the order of 0.001 inch per inch of length thereof; and

transport means for feeding paper sheets having xerographic toner thereon between said rollers.

3,884,624

NUCLEAR FUEL PREHEATING SYSTEM

Christo Andrea, Windsor Locks, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 15, 1973, Ser. No. 388,709
Int. Cl. F26b *25/00;* **G21c** *3/16*
U.S. Cl. 432—227 **5 Claims**

1. An improved nuclear reactor fuel handling system of the type having a transporter which conveys a new nuclear fuel assembly with coolant channels longitudinally therethrough through an isolation chamber into the nuclear reactor containment building, wherein the improvement comprises:

a. a heating station located in said isolation chamber for heating said fuel assembly from one end by passing heated fluid through the length of said fuel assembly; and

b. a transfer container mounted on said transporter for transporting said fuel assembly through said isolation chamber and into registry with said heating station, said transfer container adapted to carry said fuel assembly on its interior and said transfer container having a bottom

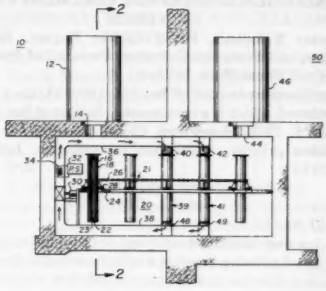


plate with at least one perforation for allowing the passage of a fluid therethrough.

3,884,625

INDOPHENOLS DYES FOR COLORING KERATIN FIBERS

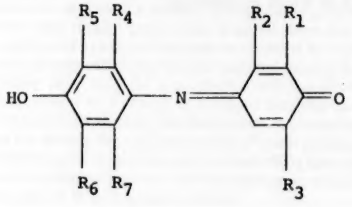
Gregoire Kalopissis, Paris; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 100,433, Dec. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 49,905, June 25, 1970, abandoned. This application Feb. 28, 1973, Claims priority, application Luxembourg, June 25, 1969, 58,954

Ser. No. 336,531
Int. Cl. D06P *3/04*

U.S. Cl. 8—10 9 Claims

1. A composition for coloring keratin fibers comprising a solution of an indophenol in a solvent selected from the group consisting of water and an aqueous solution of a lower alkanol, said indophenol having the formula



wherein

R_1 and R_3 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl and —NHCOR wherein R is lower alkyl;

R_2 represents a member selected from the group consisting of ureido, —NHCOR wherein R is lower alkyl and $—NHR_8$ represents a member selected from the group consisting of hydrogen, lower alkyl and carbamylmethyl, with the proviso that when R_2 is $—NHR_8$, R_3 is not hydrogen; and

R_4, R_5, R_6 and R_7 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy, and said indophenol being present in said dye composition in amounts ranging between 0.01 to 0.5 weight percent of said composition.

3,884,626

PROCESS FOR THE DYEING OF TEXTILE MATERIAL CONTAINING AMINO OR AMIDE GROUPS

Hansruedi Hoster, Dornach, and Branimir Milicevic, Riehen, both of Switzerland, assignors to Ciba-Geigy AG, Switzerland

Continuation of Ser. No. 124,981, March 16, 1971, abandoned. This application Apr. 6, 1973, Ser. No. 348,657
Int. Cl. D06p *3/14*

U.S. Cl. 8—54 13 Claims

1. A process for the dyeing of a textile material containing amino or amide groups, which consists essentially of performing the dyeing by exhaust dyeing in a homogeneous solution of one or several dyestuffs, each of said dyestuffs containing at least one free sulphonic acid group and at least one fiber-reactive group in a solvent mixture consisting essentially of 98 to 60 percent by weight chlorinated aliphatic hydrocarbon, admixed with 2 to 50 percent by weight of a hydrophilic solvent.

3,884,627

OXIDATIVE HAIR DYE COMPOSITIONS

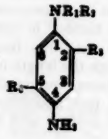
Frederick Brody, New York, and Stanley Pohl, New Rochelle, both of N.Y., assignors to Clairol Incorporated, New York, N.Y.

Filed Oct. 4, 1971, Ser. No. 186,475
Int. Cl. A61k *7/00*

U.S. Cl. 8—10.2 17 Claims

1. A non-toxic oxidation hair dye composition comprising an aqueous carrier, as a para component from about 0.1% to 6% by weight based on the total weight of the composition of a compound of formula

(a)



or acid addition salts thereof and

b. from about 0.1% to 8% by weight based on the total weight of the composition of an oxidatively couplable component comprising a meta-phenylenediamine which couples with said para component to give blue or violet compounds wherein:

R_1 is hydroxyalkyl;

R_2 is hydrogen or hydroxyalkyl;

R_3 is hydrogen, alkyl, alkoxy or halogen; and

R_4 occupies any one of the remaining positions on the benzene ring and is hydrogen, alkyl, alkoxy or halogen;

and wherein the alkyl or alkoxy contains 1 to 6 carbon atoms and the hydroxyalkyl contains 2 to 6 carbon atoms; providing that R_2 is hydrogen when R_3 is alkyl, alkoxy or halogen;

and providing that at least two of R_2, R_3 or R_4 are other than hydrogen.

3,884,628

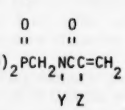
N-PHOSPHONOMETHYL ACRYLAMIDES AS FLAME RETARDING AGENTS FOR TEXTILES

James J. Duffy, Buffalo, and Peter Golborn, Lewiston, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 129,138, March 29, 1971. This application Nov. 30, 1972, Ser. No. 311,047
Int. Cl. D06m *1/00*

U.S. Cl. 8—116 P 11 Claims

1. A process for imparting flame resistance to textile materials which comprises combining a flame retardant amount of a compound of the formula



in which R is aryl or alkyl; Y is —H or lower alkyl; and Z is —H or $—CH_3$ with a textile selected from the group consisting of a cellulosic material, a proteinaceous material, polyethylene terephthalate and blends thereof.

3,884,629
METHOD OF RENDERING TEXTILES FLAME RETARDANT AND THE PRODUCT

James J. Duffy, Buffalo, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

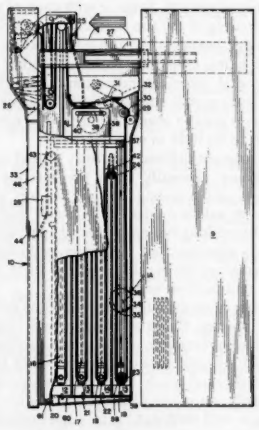
Division of Ser. No. 239,785, March 30, 1972. This application Sept. 4, 1973, Ser. No. 393,880
Int. Cl. D06m *1/00*
U.S. Cl. 8—116 P **8 Claims**

1. A process for rendering normally flammable textile materials flame retardant which comprises intimately mixing said textile materials with a flame retardant amount of a composition comprising a phosphorus containing N-hydroxymethyl amide and tetrakis (hydroxymethyl) phosphonium chloride.

3,884,630
TOWEL APPARATUS

James W. Schwartz, 500 51st St., Western Springs, Ill. 60558

Filed Aug. 8, 1968, Ser. No. 755,013
Int. Cl. D06l *1/00*
U.S. Cl. 8—142 **4 Claims**



3. A towel cleaning, drying, and dispensing apparatus comprising a cabinet, a towel, means within said cabinet for directing said towel through a predetermined path, tank means in said cabinet including cleaning fluid disposed in said path, said cleaning fluid being characterized by minimal toxicity, very low vapor pressure and evaporation rate, moderate specific heat and heat of evaporation, boiling point substantially greater than 100° C, but not excessively high, low viscosity, high solvent action for grease, waxes and soaps, faint or pleasant odor, low water solubility therein and minimal solubility in water, low flammability and high flash point, specific gravity differing substantially from that of water, chemical and thermal stability and low corrosivity.

3,884,631
PREPARATION OF CELLULOSE N,N-DIMETHYLFORMIMIDATE CHLORIDE IN TEXTILE FORM, AND CONVERSION TO HALOGENODEOXYCELLULOSES AND CELLULOSE FORMATE

Tyron L. Vigo, Kenner; Donald J. Daigle, New Orleans, and Clark M. Welch, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 26, 1973, Ser. No. 335,861
Int. Cl. D06p *3/00*
U.S. Cl. 8—194 **14 Claims**

1. As a textile material, fibrous cellulose N,N-dimethylformimidate chloride possessing the structure Cell—O—CH=$N^+(CH_3)_2$ Cl^-, wherein Cell represents a portion of a cellulose molecular chain, said material comprising a chlorine content of from 0.5 to 6 percent as well as a nitrogen content of from 0.2 to 2.4 percent, the ratio of chlorine atoms to nitrogen atoms being 1:1 and the formimidate groups being characterized by rapid hydrolysis to formate groups on contact with water, said textile material also being characterized by increased flame resistance relative to the original untreated textile.

3,884,632
CONTINUOUS DURABLE-PRESS PROCESSING OF FABRIC AND GARMENTS

George L. Payet, Cincinnati, Ohio, and Berthal D. Brummet, Barrington, Ill., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Mar. 14, 1973, Ser. No. 341,134
Int. Cl. D06m *13/12*
U.S. Cl. 8—116.4 **17 Claims**

1. A vapor-phase process for continuously treating cellulosic fabric-containing material to impart a durable press thereto comprising conveying said material through a first station to introduce moisture thereinto, conveying the material then through a second station to subject it to formaldehyde and sulphur-dioxide vapor agents, and conveying said material next through a third station to effect a drying thereof and to subject the material to a curing temperature of about 250°F.

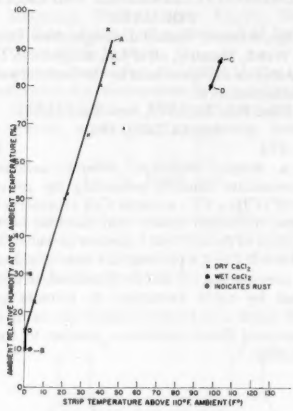
3,884,633
RUST PREVENTION OF CONTAMINATED STEEL

Roland Meadows Howard, Jr., Pittsburgh, and Richard Roy Webster, Bethel Park, both of Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed May 21, 1973, Ser. No. 361,908
Int. Cl. C23f *15/00*; **F26b** *7/00*
U.S. Cl. 21—2.5 R **6 Claims**

1. A method of preventing the substantial occurrence of rust on steel surfaces comprising the steps of: taking a steel body having a surface contaminated by deliquescent compounds and which is exposed to ambient conditions of relative humidity and temperature that are sufficient to cause rust; and placing and maintaining said steel body under controlled conditions of ambient relative humidity, steel body temperature and ambient temperature which substantially prevent the occurrence of speckled rust and do not significantly influence the metallurgical characteristics of the steel body, said controlled conditions being established and maintained by controlling said ambient relative humidity and temperature and heating and maintaining said steel body to a temperature greater than ambient temperature, wherein said controlled condition of ambient relative humidity ranges from about 20 to about 95 percent, said steel body temperature ranges from above about 110°F to about 160°F, and said ambient tempera-

ture is about 110°F; said controlled conditions of ambient relative humidity and steel body temperature being further


AMBIENT RELATIVE HUMIDITY AT 110°F AMBIENT TEMPERATURE (%)
STRIP TEMPERATURE ABOVE 110°F AMBIENT (F°)
x DRY $CaCl_2$
● WET $CaCl_2$
⊕ INDICATES RUST

defined by being located in the area to the right of curve A-B in FIG. 3.

3,884,634

END CAP FOR THE FLUID IMPREGNATION OF TIMBER

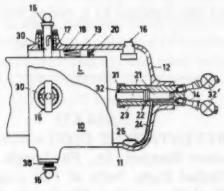
Cecil George Willmot Mason, Hwy. 60 Mapua, R.D. 1, Upper Moutere, Via Nelson, New Zealand

Filed June 27, 1973, Ser. No. 374,072

Claims priority, application New Zealand, July 3, 1972, 167652

Int. Cl. B27k *3/10, 5/02*

U.S. Cl. 21—72 **15 Claims**



1. An apparatus for longitudinal fluid impregnation of a log comprising a cap for enclosing one end of a log, the cap having a rear wall and a peripheral side wall so as to define a fluid treatment zone, locking members inserted through apertures in the side wall of the cap for slidably locking the cap to the log, a first ring for encircling the log and abutting the locking members, a compressible sealing means for encircling the log and abutting the first ring, a second ring for encircling the log and abutting the sealing means, means for preventing the second ring from moving toward said on end of the log, the first ring, the sealing means, the second ring and the preventing means respectively sequentially located on the log from the locking members toward said one end of the log to be located within the cap, ram means associated with said cap for exerting pressure on said one end of the log for longitudinally moving said locking members toward said one end of the log so that compression will be applied to the sealing means, and means for introducing a pressurized log-treating fluid into the treatment zone so that said fluid will be forced into the log.

3,884,635

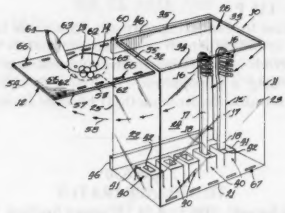
SANITARY TOOTHBRUSH HOLDER

Elizabeth Sloan, 4432 Cheer St., Ashland, Ky. 41101

Filed Aug. 24, 1973, Ser. No. 391,223

Int. Cl. A611 *3/00;* **A46b** *17/00*

U.S. Cl. 21—83 **2 Claims**



1. A toothbrush holder intended for the holding of a plurality of toothbrushes in a sanitary manner, the holder comprising, in combination:

a hollow box-like rectangularly shaped container including a horizontal bottom surface, opposed parallel vertical side wall surfaces, a front vertical wall surface, and a back vertical wall surface, said wall surfaces depending upwardly from the peripheral edges of said bottom surface and equal vertical distance with each of said wall surfaces terminating at the top thereof in a horizontally extending top edge portion, said top edge portion of said wall surfaces being co-planar with each other and definging a horizontal plane extending parallel to the container bottom surface and spaced vertically upwardly therefrom a distance greater than the length of a conventional toothbrush to be held in said container;

a compartment defined interiorly of said container surfaces extending upwardly from the interior of said bottom surface and opening out of the top of said container between said top edges of said side wall surfaces;

a plurality of longitudinally spaced apart and aligned rectangularly elongated air vent slots extending horizontally at spaced intervals in said container front wall surface adjacent said bottom surface;

a plurality of rectangularly shaped boss members longitudinally aligned and spaced apart and extending along the longitudinal midline of the interior surface of the bottom surface of said container intermediate said side wall surfaces thereof, each boss member projecting vertically upwardly an equal distance from said container bottom surface and terminating in a horizontally extending top surface;

a plurality of vertically extending rectangularly cross-section recesses, each recess disposed in one of said boss members centrally thereof and projecting vertically upwardly therethrough and opening out of said top surface thereof;

each of said recesses adapted to receive therein the handle end portion of a toothbrush inserted axially thereinto in a manner to supportedly retain the toothbrush in a vertical position projecting outwardly of the recess and into said container compartment;

said recesses of said boss members being spaced longitudinally apart along said bottom surface midline a sufficient distance to assure no possibility of contact between adjacently supported toothbrushes;

a flat rectangularly shaped cover member of a size and shape to completely close the open top end of said container compartment, the cover member having a flat top surface, a flat bottom surface, opposed parallel side edges, and opposed parallel back and front edges;

said cover being of an area configuration such that the edges of said cover member overlap the respective top

peripheral edges of the associated container side, front and back wall surfaces;

a vertical pin interconnecting a single corner of said cover defined between a side edge and a back edge thereof to a corner of said container at a top edge thereof wherein said container corner is defined as a corner between said vertical back wall surface and one of said side wall surfaces, said pin forming a hinge providing for swingable movement thereabout of said cover in a substantially horizontal plane between a closed position wherein the cover closes the top end of said container with associated cover edges overlapping and resting on associated container top edges, and an open position wherein said back edge of said cover is disposed adjacentmost to a side wall top edge of said container with said cover extending outwardly of said adjacentmost side wall and substantially parallel to said container bottom surface;

said hinge pin permitting a slight vertical canting of the main portion of said cover thereabout to provide required clearance of said cover over the top edges of said container wall surfaces when said cover is swung between said open and said closed positions about said hinge pin; said cover providing selective ingress and egress of said container compartment;

a compartment formed integrally with said cover centrally thereof and projecting downwardly therefrom out of the bottom surface thereof, the cover compartment being of an inverted hemi-spherical shaped having the base thereof opening outwardly of said top surface of said cover;

said opening being of a circular cross-sectional configuration;

a plurality of small diameter apertures disposed in spaced apart positions completely over said wall surfaces of said cover compartment to place the interior of said cover compartment in communication with the interior of said container compartment when said cover is in the closed position;

a closure cover of a circular diameter complementary to the diameter of said base opening of said cover compartment hingedly connected to said cover for movement between a closed position lying substantially co-planar with said cover in said opening and sealing said cover compartment, and an open position apart from said cover compartment opening to permit ready ingress thereinto and ready egress thereoutof;

a pair of transversely spaced apart longitudinally extending slots providing air vents in said cover member, each row of slots disposed adjacent one of the side edges of said cover member and extending longitudinally therealong and spaced slightly inwardly therefrom with the slots being spaced apart from each other, the slots being of an elongated rectangular configuration;

said cover compartment being of a sufficient size to loosely receive therein a plurality of sterilizing and dehydrating pellets of a size preventing the same from passing through said cover compartment apertures and with the fumes therefrom passing freely through said cover compartment apertures to communicate with the interior of said container compartment when said cover member is in the closed position;

said slot forming air vents in said cover member providing with said slot forming air vents in said container front wall surface a smooth slow constant air flow through the container compartment, this air flow mixing with the fumes from the pellet in the cover compartment to provide a sanitizing and dehydrating atmosphere within said container compartment about said toothbrushes stored therein;

a pair of elongated flat rectangular strips spaced vertically apart and extending horizontally across the top and bottom edges respectively of said container back wall surface between opposite side edges thereof; and

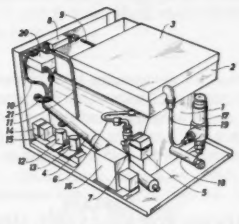
a layer of pressure sensitive adhesive disposed on the exterior surface of each of said strips to adhesively grip a vertical surface placed in juxtaposition therewith, such as a wall, door and the like, in a manner to support said container thereon.

3,884,636

STEAM STERILIZING APPARATUS

Willi Knoblauch, Nygatan 12, 440 60 Skarhaman, Sweden, and Hans-Peter Baranowski, Rathausplatz 6, 3005 Hannover-Westerfeld, Germany

Filed June 11, 1971, Ser. No. 152,061
Int. Cl. A61l *3/00*
U.S. Cl. 21—94 **9 Claims**



1. Steam sterilizing apparatus comprising a sterilization chamber, a liquid and condensing container located at a higher level than said sterilization chamber, an evaporization container located at a lower level than said liquid and condensing container, means providing communication between said evaporization container and said sterilization chamber being permanently open and having a common point being located at a higher level than the highest level of the liquid in said liquid and condensing container during the operation of the sterilizing apparatus, an interruptable air escape way between said common point and the liquid and condensing container, interruptable communication means between at the one hand a point in the liquid and condensing container being located at a lower level than the lowest level of the liquid in the latter during the operation of the sterilizing apparatus and at the other hand said evaporization container, means for directing the liquid stream towards said evaporization container and separate means for heating a jacket surrounding said sterilization chamber.

3,884,637

METHOD AND COMPOSITION FOR THE DETERMINATION OF ALBUMIN

E. Melvin Gindler, Rockford, Ill., assignor to Pierce Chemical Company, Rockford, Ill.

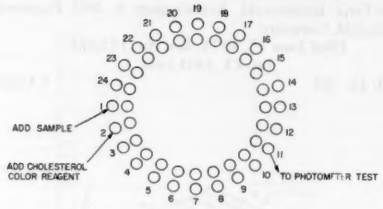
Filed Mar. 21, 1973, Ser. No. 343,438
Int. Cl. G01n *31/22, 33/16*
U.S. Cl. 23—230 B **13 Claims**

1. In a method for the determination of albumin comprising adding to an albumin containing biologic fluid an aqueous solution containing a sulphonphthalein dye buffered to an appropriate pH for sensitive spectrophotometric analysis and thereafter spectrophotometrically measuring the absorbance of the solution so formed; the improvement wherein the aqueous solution added to the biologic fluid contains a water soluble, phosphate containing anionic surfactant formed from a hydrophobic alcohol having at least eight carbon atoms, said anionic surfactant being present in an amount sufficient to prevent precipitation of protein-dye complexes.

3,884,638
METHOD OF DETERMINING CHOLESTEROL

Cheryl Dixon, Walpole, and Arnold Alpert, Natick, both of Mass., assignors to Damon Corporation, Needham Heights, Mass.

Filed Aug. 1, 1973, Ser. No. 384,515
Int. Cl. G01n *33/16*
U.S. Cl. 23—230 B **9 Claims**

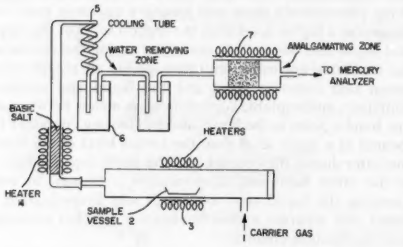


1. A method for determining total cholesterol comprising treating the cholesterol with water and a reagent containing acetic acid, acetic anhydride and sulfuric acid to form a colored substance which absorbs light at 500 nm, and measuring the optical density of the colored substance.

3,884,639
PROCESS FOR ANALYZING MERCURY

Yunosuke Sugiyama, Tokyo, Japan, assignor to Kabushiki Kaisha Sugiawa-Gen Iriki, Tokyo, Japan

Filed Feb. 4, 1974, Ser. No. 439,075
Claims priority, application Japan, Aug. 13, 1973, 48-90702
Int. Cl. G01n *7/08*
U.S. Cl. 23—230 PC **9 Claims**



1. A process for quantitatively analyzing mercury which comprises heating a mercury containing sample in the presence of oxygen to effect complete incineration of the sample to form a vapor containing atomic mercury, passing such vapor through a heated glass tube containing a basic salt, cooling the vapor, bringing the cooled vapor into contact with a metal capable of amalgamation to capture the mercury as an amalgam, heating the amalgam to regenerate mercury vapor and measuring the quantity of the mercury vapor.

3,884,640
APPARATUS TO ANALYZE FLUIDS

Richard G. Lock, Albany, and John F. Wilfore, Schenectady, both of N.Y., assignors to General Electric Company, Milwaukee, Wis.

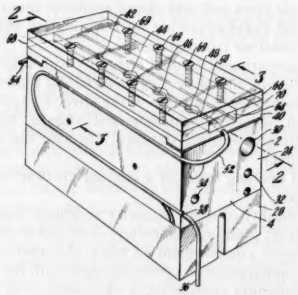
Filed Oct. 26, 1972, Ser. No. 301,145
Int. Cl. G01n *27/42, 31/00, 33/16*
U.S. Cl. 23—253 R **25 Claims**

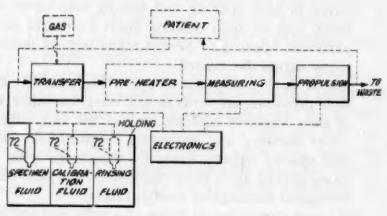
1. An apparatus for measuring at least two of the following characteristics of a fluid: pH, partial pressure of dissolved gas or gases therein, inorganic ion concentration, hemoglobin and temperature, said apparatus comprising:

a. a vessel including a flow channel for fluid passing therethrough, said flow channel including integral means for inducing turbulent flow in at least two locations therein during the measuring of the characteristics of said fluid;
b. at least two sensing means, each said sensing means being located within said channel and in proximity to one of said means for inducing turbulent flow; and
c. integral heat-exchanging means within said vessel for maintaining or achieving a preselected level of the temperature of a fluid passing through said flow channel and the sensing means in said vessel.

15. An apparatus for automatically analyzing at least two of the following characteristics of a fluid: pH, partial pressure of dissolved gas or gases therein, inorganic ion concentration, hemoglobin and temperature, said apparatus comprising:

a. plural holding means for individually storing a specimen fluid, a calibration fluid and a rinsing fluid;



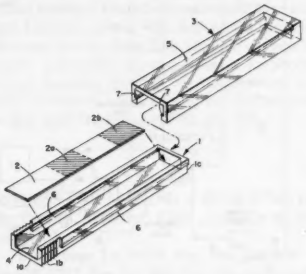


b. transfer means for removing each said fluid from the storage means and dispensing the same;
c. measuring means for receiving each said fluid, said measuring means comprising
   i. a vessel including a flow channel for fluid passing therethrough said flow channel including integral means for inducing turbulent flow in at least two locations therein during the measuring of the characteristics of said fluid;
   ii. at least two sensing means, each said sensing means being located within said channel and in proximity to one of said means for inducing turbulent flow; and
   iii. integral heat exchanging means within said vessel for maintaining or achieving a pre-selected level of the temperature of a fluid passing through said flow channel and the sensing means in said vesse!,
d. propulsion means for driving a fluid through the apparatus; and
e. electronic means for detecting and processing the output signals of the sensors, displaying and recording the characteristics of the fluid or fluids being measured.

3,884,641
REACTION CHAMBER UNIT FOR TEST STRIPS

Friedrich Kraffczyk, and Roland Helger, both of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschraentker Haftung, Darmstadt, Germany

Filed June 7, 1973, Ser. No. 367,951
Claims priority, application Germany, Oct. 11, 1972, 2249669
Int. Cl. B01l *3/00*; **B65d** *43/12*; **G01m** *33/00*
U.S. Cl. 23—253 R **6 Claims**

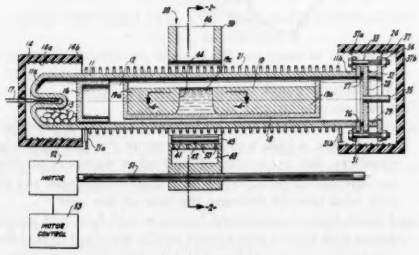


1. A reaction chamber unit for test strips, comprising a slide tray which is open at the top and at one end, and has a planar lower surface for receiving the test strip, a housing for said tray formed of a clear plastic which is open at the bottom and at one end for receiving said tray, the inner upper surface of said housing being planar, parallel to said planar lower surface of said tray, said planar surfaces having a precise, predetermined distance of separation of about 2–10 MM. when said tray is properly positioned in said housing, and guide means for guiding said tray into a precise fit in said housing, said guide means comprising a pair of diagonally extending shoulders on the outside surface of the side walls of said tray and a pair of cooperatively engaging corresponding diagonal shoulders on the inside face of the side walls of said housing, whereby said planar surfaces are automatically drawn into precise spatial relationship by the entry of said tray into said housing.

3,884,642
RADIANTLY HEATED CRYSTAL GROWING FURNACE

Theodore S. Benedict, Los Gatos, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed July 23, 1973, Ser. No. 381,500
Int. Cl. B01j *17/08, 6/00*
U.S. Cl. 23—273 SP **5 Claims**



1. In a furnace for processing semiconductor materials:

A. Means defining an axially extending chamber having a wall fabricated of a material which is transparent to heat energy of a predetermined wavelength;

B. boat mean disposed within the chamber for holding a semiconductor material;

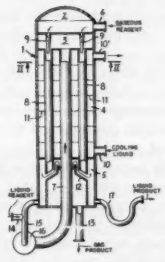
C. traveling heat source means comprising a generally annular heating element holder movable axially of the chamber and having a plurality of inwardly facing axially extending recesses, a plurality of axially extending radiant heating elements mounted in the recesses and elements spaced about the inner periphery of the heating element holder for delivering radiant heat energy of the predetermined wavelength to an axially limited portion of the material held by the boat means to melt the same, the walls of said recesses serving to reflect heat energy toward the material in the boat, and air passageways communicating with the recess in the heating element holder for directing air to the lamps and chamber wall to cool the same; means for moving the traveling heat source means axially of the chamber; and

E. the relative amounts of heat delivered by the heating elements being adustable whereby the distribution of heat peripherally of the chamber can be set to provide desired molten zone and freezing front contours in the material held by the boat means.

3,884,643
DEVICE FOR PERFORMING HIGHLY EXOTHERMIC REACTIONS

Mario Ballestra, Corso Buenos Aires 92, and Domenico Triberti, Via Burlamacchi 11, both of Milan, Italy

Division of Ser. No. 713,401, March 15, 1968, abandoned. This application Feb. 22, 1972, Ser. No. 228,409
Int. Cl. B01j *1/00*
U.S. Cl. 23—285 **14 Claims**



1. A device suitable for carrying out an exothermic reaction between a gaseous reagent and a liquid compound wherein at least one product of the reaction is liquid which comprises an elongated housing, a manifold in the upper end of said housing, a separation chamber in the lower end of said housing for separating gaseous material from said liquid product, at least one reaction conduit within said elongated housing providing fluid communication between said manifold and separation chamber, the inlet end of said reaction conduit being at said manifold and the outlet end of said reaction conduit being at said separation chamber, discharge means for discharging said liquid product from said separation chamber, mixing means connected to said discharge means for mixing liquid reagent with at least part of said liquid product discharged from said separation chamber, at least one mixing-and-recycle conduit inside said housing providing fluid communication between said mixing means and said manifold for mixing said liquid reagent and recycled liquid product and for circulating said liquid reagent and recycled liquid product from the bottom to the top of said mixing-and-recycle conduit so that said liquid reagent and recycled liquid product in admixture then flow into said reaction conduit, at least one nozzle coaxial to and at the inlet of said reaction conduct for feeding said gaseous reagent into said reaction conduit in concurrent flow relationship with the mixture of liquid reagent and recycled liquid

product, and means for controlling the temperature of said reaction conduit.

3,884,644

PROCESS FOR RECOVERING AMMONIUM SULPHATE FROM AQUEOUS SOLUTIONS OF AMMONIUM SULPHATE CONTAINING ORGANIC CONSTITUENTS AND HEAVY METAL IONS

Jentje Bonnema, Beek, and Henri J. H. Simon, Geleen, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Continuation of Ser. No. 72,788, Sept. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 798,155, Feb. 10, 1969, abandoned. This application Jan. 3, 1973, Ser. No. 320,765

Int. Cl. B01d *9/02;* **C01c** *1/24*

U.S. Cl. 23—299 **5 Claims**

1. An improved process for recovering ammonium sulfate from an impure solution thereof obtained from the synthesis of organic compounds, said aqueous solution containing ammonium sulfate and tarry organic constituents and at least one heavy metal ion selected from the group consisting of ferrous, ferric, chromium, nickel, copper and mixtures thereof, said organic compounds selected from the group consisting of:

a. acrylonitrile prepared by oxidation of gaseous propylene in the presence of ammonia wherein the reaction product is treated with sulfuric acid and then separated from the resulting ammonium sulfate solution;

b. methyl methacrylate prepared from acetone, cyanohydrin, methanol and sulfuric acid; and

c. methacrylate prepared from acrylonitrile, methanol and sulfuric acid;

the improvement which consists in first adding to said ammonium sulfate solution, a water-soluble Werner complex forming compound with the heavy metal ions contained in said solution, said compound being selected from the group consisting of acetic acid, nitroliotriacetic acid and α,α'-dipyridyl, and thereafter treating said solution with a water soluble organic substance selected from the group consisting of dioxan, dimethyl formamide, acetonitrile, lactams containing 4 to 20 carbon atoms and mixtures thereof,

said water-soluble organic substance being one which, at least in combination with a saturated aqueous ammonium sulfate solution, is capable of forming a two layer liquid phase system, wherein the said tarry organic constituents and the said heavy metal ions in Werner complexed form are both extracted into one of said layers and the other of said layers contains an aqueous solution of purified ammonium sulfate,

thereafter separating said ammonium sulfate solution layer, and

crystallizing therefrom purified substantially water-white, cubical ammonium sulfate crystals.

3,884,645

PRODUCTION OF ANHYDROUS SODIUM METASILICATE IN A FLUIDIZED BED

Walter E. Kinne, Fort Montgomery, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Continuation of Ser. No. 28,028, April 13, 1970, abandoned, and a continuation-in-part of Ser. No. 1,089, Jan. 7, 1970, abandoned. This application Sept. 12, 1972, Ser. No. 288,471

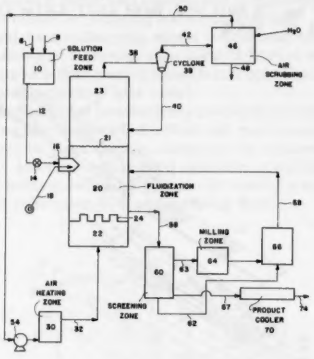
Int. Cl. C01b *33/32;* **B01j** *2/16*

U.S. Cl. 23—313 **11 Claims**

1. A process for producing uniform spherical anhydrous sodium metasilicate particles of high attrition resistance and a minimum dust content, said process comprising:

a. providing a plurality of anhydrous sodium metasilicate particles in a fluidization zone;

b. contacting said particles in said fluidization zone with an upwardly flowing stream of heated air having a superficial velocity of between about 75 and about 200 feet per minute thereby providing a dilute upper phase of fine particulate anhydrous sodium metasilicate and a lower dense fluidized bed of said particles of anhydrous sodium metasilicate; and



c. contacting said particles in said dense fluidized bed with an aqueous sodium metasilicate liquor to produce crystallized anhydrous sodium metasilicate said aqueous sodium metasilicate liquor being sprayed directly into said fluidization zone below the meniscus separating said dilute upper phase and said lower dense fluidized bed.

3,884,646

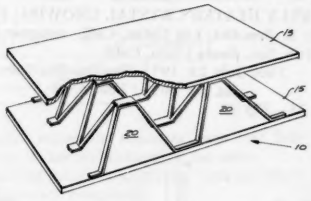
STRUCTURAL PANEL AND METHOD OF FABRICATION THEREOF

James T. Kenney, 1675 Elevado, Arcadia, Calif. 91006

Filed Dec. 5, 1972, Ser. No. 312,381

Int. Cl. B32b *3/00*

U.S. Cl. 29—191.4 **19 Claims**



1. A structural panel, comprising:

first and second structural sheets; and

a plurality of skeletal pyramid-shaped structural units having an apex, a base and three or more straight rigid edge members, the apex ends of said edge members meeting one another in proximity to the apex of the unit and the base ends thereof defining the base of the unit,

said units being sandwiched between said first and second sheets with part of said apexes rigidly attached to said first sheet and part of said bases attached to said second sheet.

6. Panel as in claim 4, wherein the material comprising the matrix adjacent to one of said structural sheets is of heavier gauge than that comprising the matrix adjacent to the other of said structural sheets.

3,884,647
DETERGENT AUTOMOTIVE FUEL COMPOSITION

Glenn M. Nakaguchi, Irvine, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Aug. 9, 1973, Ser. No. 387,207
Int. Cl. C10l *1/26*
U.S. Cl. 44—72 **10 Claims**

1. A fuel composition comprising a major proportion of a liquid hydrocarbon fuel and dissolved therein an effective detergent proportion of an additive comprising a mixture of N-aliphatic hydrocarbyl, N-hydroxyalkyl alkylene polyamines, the aliphatic hydrocarbyl radicals thereof being essentially saturated and having a branched chain structure and a molecular weight between about 400 and 4,000 the hydroxyalkyl radicals thereof having from 2 to about 6 carbon atoms, and said alkylene polyamine having from 2 to about 6 amine groups linked together through alkylene groups having from 2 to about 6 carbon atoms, a substantial portion of the amine groups in said additive being $—NH_2$ groups.

3,884,648
PROCESS FOR MAKING A REDUCING GAS

William B. Crouch, Whittier, Calif., assignor to Texaco Inc., New York, N.Y.

Filed June 28, 1972, Ser. No. 266,934
Filed June 28, 1972, Ser. No. 266,934. The portion of the term of this patent subsequent to Oct. 8, 1991, has been disclaimed.
Int. Cl. C01b *2/14*
U.S. Cl. 48—197 R **9 Claims**

1. A process for producing gaseous mixtures comprising principally hydrogen and carbon monoxide comprising simultaneously introducing into the reaction zone of a free-flow unpacked noncatalytic gas generator a free-oxygen containing gas, a liquid hydrocarbonaceous fuel, a methane-rich gas comprising at least **22** mole % of methane and H_2O from and external source, said free-oxygen containing gas comprising 0.6 to 1.2 atoms of free oxygen per atom of cabon present in the reaction zone, said methane rich gas comprising 0.25 to 0.75 parts by weight of said methane-rich gas for each part by weight of said liquid hydrocarbonaceous fuel, and said H_2O being introduced in an amount in the range of about 0.05 to 0.20 parts by weight of H_2O per part by weight of the combustible fuel in said reaction zone; reacting said materials by partial oxidation in said reaction zone at an autogenous temperature in the range of about 1,500° to 3,500°F. and at a pressure in the range of about 1 to 250 atmospheres; and removing from said reaction zone a product gas stream comprising H_2, CO, H_2O, CO_2 and particulate carbon in the amount of about 0.01 to 20 percent by weight of carbon in the liquid hydrocarbon; wherein the reducing ratio moles H_2+CO/H_2O+CO_2 of said product gas is at least about 9.

3,884,649
COAL PRETREATER AND ASH AGGLOMERATING COAL GASIFIER

Charles W. Matthews, Darien, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Filed Oct. 29, 1973, Ser. No. 410,476
Int. Cl. C10j *3/16*
U.S. Cl. 48—202 **6 Claims**

1. A process for the conversion of a finely divided carbonaceous material containing ash to a fuel gas having a heating value of between 100 – 300 BTU per cubic foot which comprises:

i. pretreating a finely divided carbonaceous feed material by mild oxidation at a temperature of about 700°–800°F for about 10 to 30 minutes to destroy any caking properties of the carbonaceous feed material in a fluidized pretreatment zone;

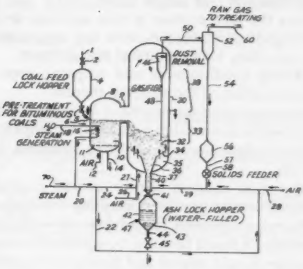
ii. said fluidized pretreatment zone being in direct fluid communication with an adjacent gasification zone;

iii. withdrawing heat from the pretreatment zone by indirect heat exchange with water to produce steam and to maintain said pretreatment temperature;

iv. passing the pretreated carbonaceous material and the resultant gases from the upper portion of the pretreatment zone to said gasification zone and passing at least a portion of the steam produced in said pretreatment zone to said gasification zone;

v. said gasification zone being maintained at the same pressure as the pretreatment zone;

vi. maintaining the pretreated carbonaceous material as a fluidized bed in the lower portion of the gasification zone at conditions sufficient to convert said pretreated material to ash and a gaseous mixture of fuel gas and oils and tars;



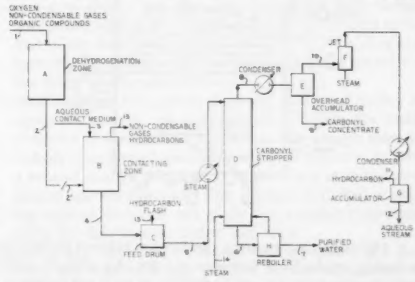
vii. passing the gaseous mixture to the upper portion of said gasification zone above the fluidized bed and maintaining the gaseous mixture in the upper portion of the gasification zone at a temperature of about 1,200°– 1,500°F for about 10 – 100 seconds to crack the oils and tars in the gaseous mixture; and

viii. withdrawing ash from the bottom of said gasification zone.

3,884,650
WASTE DISPOSAL FROM OXIDATIVE DEHYDROGENATION

Rudolph C. Woerner, Houston; Lloyd D. Tschopp, Humble, and Carl O. Oelze, Houston, all of Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Filed July 11, 1973, Ser. No. 378,292
Int. Cl. B01d *19/00*
U.S. Cl. 55—54 **5 Claims**



1. In a process for preparation of butadiene -1,3 comprising oxidatively dehydrogenating a stream having butene-2 as the major hydrocarbon component, in the presence of air and stream,

producing a product stream comprising from 8 to 65 mol percent butadiene -1,3, from 0.1 to 40 mol percent butene, from 40 to 75 mol percent nitrogen, and from 0.03 to 0.30 mol percent carbonyl compounds exclusive of water,

contacting said product stream with an aqueous medium having a pH of 10 to 12,

recovering an aqueous stream containing the principal amount of carbonyl compounds from said product stream,

removing a portion of said hydrocarbons from said aqueous stream, and,

feeding said aqueous stream to a steam stripping zone,

wherein the improvement comprises said aqueous stream having from 0.045 to 0.06 mol percent carbonyl compounds, from 0.036 to 0.042 mol percent hydrocarbons and from 99.86 to 99.88 mol percent water,

said stripping zone operating at a temperature in the range of 80° to 179°F at 2.5 to 5 psia,

adjusting the temperature of said aqueous stream prior to feeding into said stripping zone to a temperature less than the operating temperature of said stripper,

maintaining conditions in said stripping zone to provide internal reflux of the material therein,

withdrawing a gaseous overhead from said stripping zone, said overhead containing at least 80 percent of the carbonyl compounds fed into said stripping zone in said stream,

condensing an aqueous portion of said gaseous overhead, said condensed portion containing the major amount of carbonyl compounds in said gaseous overhead, and

withdrawing a liquid bottoms, comprising the major amount of water in said stream and having substantially less carbonyl compounds than said stream.

3,884,651

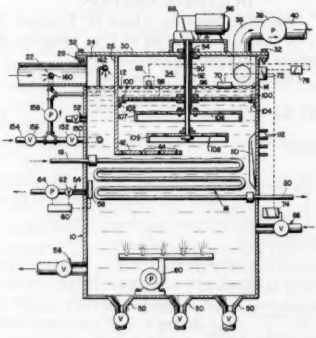
METHOD AND APPARATUS FOR REMOVING HEAT AND ELEMENTS FROM EXHAUST

John L. Velegol, Rt. No. 1, Colliers, W. Va. 26035

Continuation of Ser. No. 86,592, Nov. 3, 1970, abandoned, which is a continuation of Ser. No. 842,098, July 16, 1969, abandoned, which is a continuation-in-part of Ser. No. 537,630, March 25, 1966, abandoned. This application Dec. 30, 1971, Ser. No. 214,480

Int. Cl. B01d *47/02*

U.S. Cl. 55—86 **18 Claims**



1. The method of treating combustion exhaust gas products, including smoke from furnaces and the like wherein ambient heat, foreign particles and impurities in such gas products are removed for utilization as desired, comprising the steps of: providing at least one closed container carrying a body of liquid material at temperatures lower than that of the gas products to be treated; maintaining the body of liquid material to desired levels; introducing and subjecting such exhaust gases to substantial surface areas of the liquid material and thereby transferring heat, particles and impurities from the gas products to and trapping the same in the liquid material; exhausting the treated gas products from the container; using a heat exchanging means having a portion thereof immersed in said liquid material to absorb heat transferred from the liquid material and transferring the heat via the heat exchanging means to a location exterior of the container; said gas products being passed down and up through the body of liquid material, contacting a substantial part of the body of liquid material and during such passage, passing the gas products adjacent the portion of the heat exchanging means internal of the tank so that both the gas products and the liquid material are simultaneously transferring heat into that portion of the heat exchanging means; concentrating solids transferred to the liquid material at desired locations within the container; and removing the solids from said locations for further disposition.

3,884,652

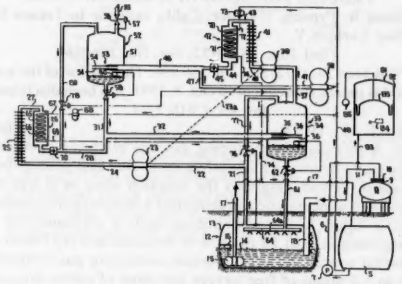
VAPOR RECOVERY WITH AMBIENT COOLING

Richard A. Nichols, 519½ Iris, Corona Del Mar, Calif. 92014

Filed Mar. 9, 1973, Ser. No. 339,584

Int. Cl. B01d *53/14*

U.S. Cl. 55—88 **25 Claims**



1. A vapor recovery system for recovering volatile liquid vapors, said vapor recovery system comprising a first absorber-separator for receiving collected vapors, first compressor means associated with said first absorber-separator for delivering collected vapors to said first absorber-separator at a first pressure, a second absorber-separator for receiving a vaporair mixture from said first absorber-separator, second compressor means associated with said second absorber-separator for delivering vapor-air mixture from the first absorber-separator to said second absorber-separator at a second and higher pressure, means for delivering condensed vapors from said first and second absorber-separators to a collection area, and means for utilizing only ambient air for cooling said vapors.

3,884,653

SYSTEM FOR PURIFICATION OF GASES

Giuseppe Capulli, Rua General Cristovao Barcelos, 180, Apt. 102, Laranjeiras; Gasparino Jose DeSant, Rua Aristides Espinola, Leblon, Apt. 304, Guanabara; Theodoro DeCarvalho, Rua Hilario de Gouveia No. 30, Apt. 402, Guanabara, and Helio Marcos Penna Beltrao, Rua Prudente de Morais, No. 1.179, last floor, Guanabara, all of Brazil

Filed July 27, 1973, Ser. No. 383,079

Int. Cl. B01d *47/02*

U.S. Cl. 55—223 **4 Claims**

1. A system for removing impurities, including soot from residual gases such as flue and exhaust gases comprising

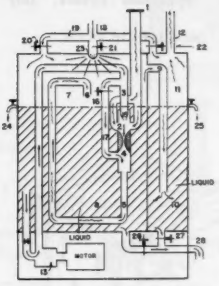
an enclosed tank having a liquid retaining lower portion and a gas holding space above the liquid retaining portion,

means for maintaining liquid at a predetermined level in said tank,

a Venturi-type suction means having a Venturi-type constricted discharge opening and positioned with the discharge opening below the predetermined liquid level,

a first pipe means extending outside the enclosed tank connecting said Venturi-type suction means to a source of residual gas to be purified,

said Venturi-type suction means comprising a nozzle constructed and arranged to supply liquid to the constricted opening,



pump means including a pipe line for passing liquid from the tank under pressure to the nozzle of the Venturi-type suction means,

a second pipe means connecting the discharge opening of the Venturi-type suction means to the gas holding space above the liquid retaining portion, a substantial portion of said second pipe means being immersed in the liquid retaining portion of said tank below the predetermined liquid level.

3,884,654

DEVICES FOR FORMING A HOMOGENEOUS SHEET OF A FLOWING SUBSTANCE

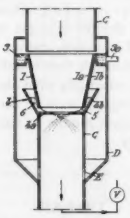
Philippe de Crevoisier, Nancy, and John George Stockholm, Pont-a-Mousson, both of France, assignors to Tunzini-Ameliorair, Paris, France

Filed Jan. 17, 1972, Ser. No. 218,186

Claims priority, application France, Feb. 3, 1971, 71.03650; Apr. 26, 1971, 71.14834; May 26, 1971, 71.19056

Int. Cl. B01d *47/02*

U.S. Cl. 55—225 **27 Claims**



1. A device for producing a homogeneous sheet of liquid for washing polluted gas, the device comprising a liquid supply; an inclined first wall; means for causing liquid from said liquid supply to trickle down on one side of said first wall to form a sheet of liquid thereon; reserve means defining a reserve liquid volume, said reserve means comprising a second wall, said second wall being spaced from the other side of said first wall and having an upper portion facing said other side of said first wall to define a reserve liquid tank, and a lower portion extending from said upper portion and spaced below the lower edge of said first wall and cooperating with the lower edge of said first wall to define a slot, said lower portion extending transversely beyond the lower edge of said first wall; means for causing a stream of polluted gas to flow over said one side of said first wall so that said liquid will wash said gas; and means for placing the top surface of said reserve liquid volume in said reserve liquid tank in communication with a zone of the device situated downstream of the lower edge of said first wall with respect to the flow of polluted gas, such that, in operation, the lowered pressure induced by said stream is communicated to said reserve liquid tank and causes suction of liquid into the reserve tank through said slot, the liquid in the reserve tank being available to compensate for streaking in said sheet of liquid.

3,884,655

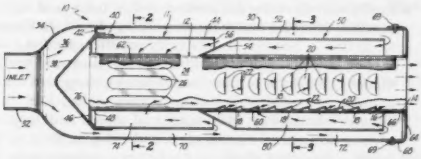
SPARK ARRESTER AND SILENCER

Jeffrey W. Coop, 13036-D Los Nietos Rd., Santa Fe Springs, Calif. 90670

Filed Apr. 22, 1974, Ser. No. 462,934

Int. Cl. B01d *50/00*

U.S. Cl. 55—276 **2 Claims**



1. A spark arrester and silencer comprising:

a core comprising a tube having an upstream portion and a downstream portion, the tube being open at its downstream end for the outlet of gas, said tube having a plurality of sets of longitudinally spaced openings, said sets being annularly spaced apart, at least one set of said openings being positioned in said upstream portion of said tube, and at least one set of said openings being positioned in said downstream portion of said tube;

means closing the upstream end of said tube against the entrance of gases;

a fine mesh screen disposed about said tube to cover said openings;

a first cylindrical conduit about said upstream portion of said tube, said first conduit having a greater interior diameter than the exterior diameter of said tube and screen, to form a first annular passageway between the upstream portion of said tube and said first conduit, the downstream end of said first conduit being open, and terminating adjacent the downstream portion of said tube;

said means closing the upstream end of said tube further comprises a generally conical deflector connected to the end of the first conduit adjacent said closed end of said tube, the apex of said deflector being adjacent the inlet of the spark arrester and silencer;

a shell in which the core is disposed, said shell having an upstream portion and a downstream portion, the inside diameter of said shell being substantially greater than the outside diameter of said first conduit of the core, to form a second annular passageway between the upstream portion of said shell and said first conduit, said shell extending beyond the open end of the first conduit to substantially the downstream end of said tube;

whereby said upstream portion of said tube, said first conduit, and said upstream portion of said shell coact to define a first upstream muffler section, said first muffler section and said deflector causing gas to flow longitudinally along said second annular passageway, to reverse flow along said first annular passageway, to traverse said screen and openings of said upstream portion of said tube, to flow in the original direction along said tube, and to exit at the downstream end of the said tube;

a second cylindrical conduit positioned about said downstream portion of said tube, said second conduit having a

greater interior diameter than the exterior diameter of said tube and screen, to form a third annular passageway between the downstream portion of said tube and said second conduit, the downstream end of said second conduit being open, and terminating at substantially the downstream end of said tube, said second conduit having its upstream end closed by attachment to the exterior of said tube at said upstream portion thereof;

the inside diameter of said shell being substantially greater than the outside diameter of said second conduit, to form a fourth annular passageway between the downstream portion of said shell and said second conduit;

the upstream end of said shell tapering inwardly and terminating in an inlet for gases, the tapered portion of said shell forming a chamber;

means providing a seal between the downstream end of said shell and the downstream end of said tube, said sealing means being spaced from the downstream end of said second conduit;

whereby said downstream portion of said tube, said second conduit, and said downstream portion of said shell coact to define a second downstream muffler section, said second muffler section, said deflector, and said sealing means causing gas to flow longitudinally along said fourth annular passageway, to reverse flow along said third annular passageway, to traverse said screen and openings of said downstream portion of said tube, to flow in the original direction along said tube, to comingle with the gas from said first muffler section, and to exit at said downstream end of said tube;

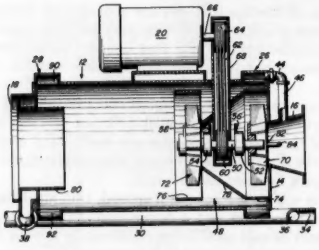
said first and second muffler sections being similar in structure and function, being longitudinally separated, and being substantially aligned and coaxial.

3,884,656

RECIRCULATING AIR CLEANER

Clifford T. Deane, P.O. Box 817, Strawberry Rd., St. Albans, W. Va. 25177

Filed June 28, 1974, Ser. No. 485,148
Int. Cl. B01d *47/06*
U.S. Cl. 55—257 **10 Claims**



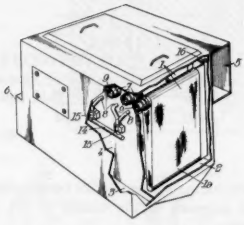
10. In combination with a gas cleaning device having a housing through which a vortical flow stream of contaminated gas is conducted toward an exhaust outlet and liquid is injected into the flow stream to form a slurry of liquid and contaminants centrifugally separated from the gas discharged from the outlet; the improvement comprising collection means connected to the housing in radially spaced relation to the outlet for receiving said slurry, said collection means enclosing a lower collection zone within which the slurry accumulates and an upper zone within which gas evolving from the accumulated slurry is received, and gas recycling means connected to the upper zone of the collection means in radially spaced relation to the outlet for returning said evolving gas to the vortical flow stream within the housing.

3,884,657

FILTERING DEVICES WITH AT LEAST ONE FILTERING CAVITY

Albert Rebours, Chatou, and Christian Carre, Houilles, both of France, assignors to Air-Industrie, Courbevoie, France

Filed July 20, 1973, Ser. No. 381,001
Claims priority, application France, July 28, 1972, 72.27274
Int. Cl. B01d *46/04*
U.S. Cl. 55—293 **7 Claims**



1. In a filtering device, the combination comprising: at least one filtering cavity in the form of a hollow member of filter material; means defining an inlet enclosure containing said filtering cavity; means for introducing a gas to be filtered into said inlet enclosure so as to be exposed to the external sides of said filtering cavity; an outlet enclosure separated from said inlet enclosure by a separating partition; an open ended connecting pipe connecting the cavity interior to the oulet enclosure by passing through the separating partition; exhausting means for evacuating filtered gas out of said outlet enclosure, said filtered gas having passed through the cavity from the exterior thereof to the interior thereof; and gas injection means, including an injection nozzle, arranged in said outlet enclosure opposite the open end of the connecting pipe in the outlet enclosure for introducing from time to time and during relatively short periods a flow of clearing gas under pressure into said filtering cavity, in counter flow with respect to the normal issuing flow of the filtered gas out of the cavity; and means connecting said injection means to a supply of compressed clearing gas, through controllable valve means; said connecting pipe being internally provided with fixed helicoid blade means for effecting rotation of the flow of clearing gas delivered by said injection means as said clearing gas passes into said filtering cavity.

3,884,658

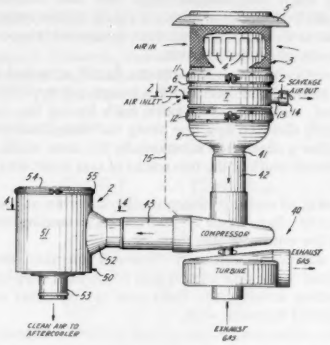
AIR CLEANER FOR SUPERCHARGED ENGINES

Charles J. Roach, Brooklyn, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Apr. 18, 1972, Ser. No. 245,166
Int. Cl. B01d *50/00*
U.S. Cl. 55—315 **8 Claims**

1. An air cleaner-supercharger-compressor assembly for supercharged engines including a supercharger compressor comprising, in combination, a vortex air cleaner, a supercharger compressor, and a barrier filter, each in series fluid flow connection with the other, and each having an inlet and an outlet; the outlet of the air cleaner being in fluid flow connection with the inlet of the supercharger-compressor, and the outlet of the supercharger-compressor being in fluid flow connection with the inlet of the barrier filter; the air cleaner being disposed upstream of the supercharger compressor, and

the barrier filter being disposed downstream of the supercharger compressor, the barrier filter being capable of withstanding elevated temperatures of at least about 250° F to about 350°F.



3,884,659

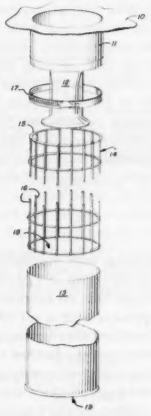
FILTER BAG ASSEMBLY FOR PULSE JET COLLECTOR

Frank M. Ray, Hoffman Estates, Ill., assignor to Flex-Kleen Corporation, Chicago, Ill.

Filed June 3, 1974, Ser. No. 475,518

Int. Cl. B01d *46/02*

U.S. Cl. 55—379 **3 Claims**



1. A freely suspended filter bag assembly for a pulse jet type dust collector comprising an elongated, generally cylindrical wire cage having an end ring defining an open cage end, an elongated sleeve-like bag of porous flexible filter media disposed in slack telescoping relation along said cage and having a circumambient bag end portion defining an open end adjacent said end ring and a metal end cap for closing said open end of the bag and including a circumambient clamping rim portion in airtight peripheral engagement with the circumambient bag end portion, said end cap having a pilot portion axially offset from said rim portion and projecting into said end ring in mechanically interlocked relation with said end ring to center and hold the circumambient bag end portion and said end ring of the cage in peripherally spaced apart relationship.

3,884,660

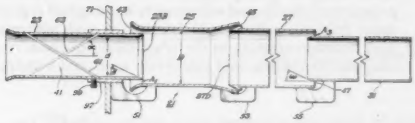
GAS-LIQUID SEPARATOR

Marney Dunman Perry, Jr., Mineral Wells, Tex., and Robert A. Graff, Live Oak, Fla., assignors to Perry Equipment Corporation, Mineral Wells, Tex.

Filed Dec. 7, 1973, Ser. No. 422,966

Int. Cl. B01d *45/16*

U.S. Cl. 55—396 **23 Claims**



1. A separator for removing from a gas stream, heavier components present in the gas stream, comprising:

a housing chamber,

a gas stream inlet conduit extending into said chamber and having an upstream end and a downstream end, the latter of which is located in said chamber,

gas swirl means located in said inlet conduit for imparting a swirling motion to the gas stream,

a separation conduit axially aligned with said inlet conduit, the downstream end of said inlet conduit being coaxially located within the upstream end of said separation conduit defining an annular injection orifice for the entry of recirculating gas from said chamber,

conduit means axially aligned with said inlet conduit and said separation conduit and having an upstream end coaxially located within the downstream end of said separation conduit defining an annular ejection port for the removal of said heavier components from said gas stream, said separation conduit between said downstream end of said inlet conduit and said upstream end of said conduit means and from its axis radially outward to its surrounding wall being free of internal structure,

said annular ejection port being formed by an inward facing surface formed on the downstream end of said separation conduit and by an outward facing surface formed on the upstream end of said conduit means,

said inward and outward facing surfaces flaring outward in the downstream direction at different angles relative to the axis such that the distance between said flared inward and outward facing surfaces decreases at positions radially outward from the axis and in the downstream direction from the entrance to said ejection port,

said conduit means including a downstream end extending out of said chamber for the passage of gas separated from said heaview components, and

means for removing from said chamber said components separated from the gas stream.

3,884,661

METHOD OF AND INSTALLATION FOR FRACTIONATION BY ADSORPTION

Guy Simonet, Paris, France, assignor to L'Air Liquide, Societe Anonyme pour L-Etude et L-Exploitation des Procedes Georges Claude, Paris, France

Filed Sept. 11, 1972, Ser. No. 287,728

Claims priority, application France, Sept. 13, 1971, 71.32900

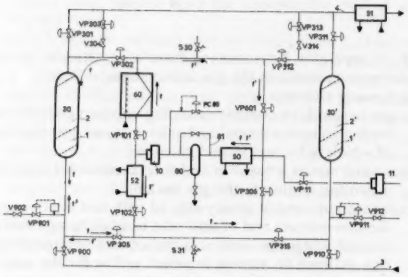
Int. Cl. B01d *53/04*

U.S. Cl. 55—62 **1 Claim**

1. A method of fractionation of a gaseous mixture, employing at least an adsorption zone comprising an adsorbent mass which preferentially adsorbs at least a constituent of said gaseous mixture, comprising at least an elementary adsorption cycle carried out with at least said adsorption zone, said adsorption cycle comprising successively:

a. in an adsorption phase, introducing said gaseous mixture, under an adsorption pressure, into said adsorption zone in an adsorption direction, and withdrawing a gaseous fraction impoverished in at least said constituent from said adsorption zone in said adsorption direction,

b. in a regeneration phase, circulating a gaseous regeneration fraction, originating exclusively from a gaseous residual fraction contained in said adsorption zone at the end of the preceding phase, in a closed regeneration circuit under a regeneration pressure lower than said adsorption pressure, cyclically and successively heating said regeneration fraction, passing said fraction in said adsorption zone countercurrently to the adsorption direction, recycling said fraction to said adsorption zone, and withdrawing at least the desorbed said constituent in excess from said closed regeneration circuit,



c. in a cooling phase, circulating a gaseous cooling fraction, originating exclusively from another gaseous residual fraction contained in said adsorption zone at the end of the preceding phase, in a closed cooling circuit under a cooling pressure substantially equal to said regeneration pressure, cyclically and successively cooling said cooling fraction, passing said cooling fraction in said adsorption zone concurrently to the adsorption direction, recycling said cooling fraction to the adsorption zone, and introducing a gaseous fraction impoverished in at least said constituent into said regeneration circuit for balancing the cooling fraction in default.

3,884,662

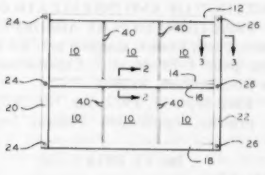
AIR FILTER AND SUPPORT FRAME

Stephen M. Hladik, Belmont Village, Apt. 31-B, Liverpool, N.Y. 13088

Continuation-in-part of Ser. No. 248,424, April 28, 1972, abandoned. This application Sept. 17, 1973, Ser. No. 397,935

Int. Cl. B01d *27/08*

U.S. Cl. 55—484 **12 Claims**



1. An air filter support frame comprising in combination:

a. a first horizontally disposed support having three parallel, upwardly directed lips, one along each longitudinal edge and one intermediate thereof, to define two adjacent tracks;

b. a second horizontally disposed support, parallel to and spaced a predetermined distance above said first support and having three parallel, downwardly directed lips, one along each longitudinal edge and one intermediate thereof, to define two adjacent tracks of the same width as the two tracks of said first horizontal support and vertically aligned therewith;

c. two vertically disposed supports, fixedly attached to said first and second horizontal supports at opposite ends thereof, said vertical supports each having two parallel inwardly directed lips, one along each longitudinal edge, to define a channel of substantially the same width as the combined width of the two tracks of said horizontal members;

d. a gasket of resilient material affixed within at least one vertically aligned pair of said tracks, extending substantially the entire lengths thereof;

e. an additional vertically disposed member movably mounted upon one of said pair of vertical supports and extending substantially from one to the other of said horizontal supports; and

f. means connected to one of said vertically disposed supports for moving said vertical member away from and toward said one vertical support while remaining substantially parallel thereto.

3,884,663

REFRIGERATOR SYSTEM WITH REFRIGERANT EXPANSION THROUGH CAPILLARY TUBES OF ADJUSTABLE LENGTH

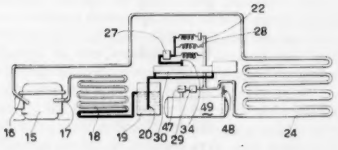
Ettore Funaro, Pizza Cimone 2, Rome, Italy

Filed May 6, 1974, Ser. No. 467,443

Claims priority, application Italy, May 8, 1973, 4938/73

Int. Cl. F25b *41/04*

U.S. Cl. 62—222 **4 Claims**



1. A refrigerator system with mechanical compression and refrigeration cycle comprising a compressor, a condenser connected to a discharge line, an evaporator connected to the suction line to compressor and a set of capillary expansion tubes in parallel to one the other between said condenser and said evaporator, which system further comprises a receiver tank connected to the outlet of condenser which receiver is provided with an outlet pipe of which the open end terminates at nearly the bottom of the receiver and which passes through the top thereof to communicate with a regulating device comprising at least a capillary tube of which the length is adjusted to fit the temperature changes of said evaporator the outlet of said regulating device being connected to one end of said set of capillary tubes of which the other end communicates with a vertical manifold; a siphon being provided at the lower end of said manifold; a collector tank being connected to said siphon at the lowermost point thereof through a check valve and through a capillary tube of which one end terminates at nearly the bottom of said tank and at the other end communicates with said siphon at a point higher than said lowermost point and located between the latter and the condenser; said system being further provided with a first solenoid controlled valve located between said regulating device and said set of fixed capillary tubes which valves is open when the compressor is running and with a second solenoid controlled valve

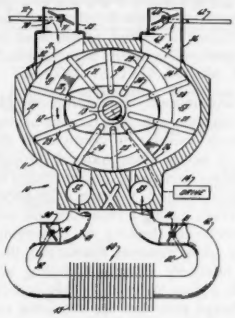
located between said check valve and said siphon which valve is open when the compressor is not running.

3,884,664

THROTTLE VALVE ARRANGEMENT FOR NOISE CONTROL IN COMPRESSOR-EXPANDER

Thomas C. Edwards, Casselberry, Fla., assignor to The Rovac Corporation, Maitland, Fla.

Filed Apr. 23, 1974, Ser. No. 463,296
Int. Cl. F25d *19/00*
U.S. Cl. 62—296 **8 Claims**



1. In a refrigeration system the combination comprising a compressor-expander including a frame defining a chamber having a compression side and an expansion side, a vane type rotor means mounted in the chamber for positive displacement of air in the form of entering and exiting charges, the frame defining compression side inlet and outlet ports as well as expansion side inlet and outlet ports, a heat exchanger connected between the compression side outlet port and the expansion side inlet port so that upon driving of the rotor means air drawn into the compression side is compressed between adjacent vanes, cooled in the heat exchanger to remove the heat of compression, expanded between adjacent vanes, and discharged in the cold state, and a throttle valve in the path of the air flowing through the heat exchanger, the throttle valve being adjustable for alternatively enlarging and narrowing the cross section of the air stream to vary the pressure drop in the heat exchanger so that the initial pressure of an exiting charge of air more nearly matches the pressure of the air at the discharge side of the expansion side outlet port, thereby to minimize explosive puffing of air and its attendant noise upon traverse of the vanes past the expansion side outlet port.

3,884,665

FLAT GLASS MANUFACTURING APPARATUS AND METHOD

Charles K. Edge, Sarver, and Gerald E. Kunkle, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 338,497, March 6, 1973, Pat. No. 3,843,346. This application Mar. 27, 1974, Ser. No. 455,463
Int. Cl. C03b *18/02*
U.S. Cl. 65—99 A **16 Claims**

1. An apparatus for the manufacture of flat glass comprising:

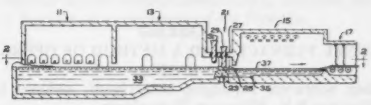
a. a glass melter;

b. a glass conditioner connected to said glass melter;

c. means for forming a continuous, dimensionally stable sheet of glass including a pool of molten metal upon which glass floats during forming said pool of molten metal having an upper surface; and

d. means connected to said glass conditioner and to said forming means for delivering molten glass from said glass conditioner onto said pool of molten metal of said forming means; wherein said delivery means is an enclosed channel comprising:

1. a threshold member over which molten glass may flow extending transversely across the bottom of said channel and having an upwardly-facing, convex upper surface having a highest portion located at least at the



elevation of the upper surface of said pool of molten metal, said threshold member being located for separating said pool of molten metal from molten glass in said glass conditioner;

2. side members extending upwardly from both ends of said transversely extending threshold member; and

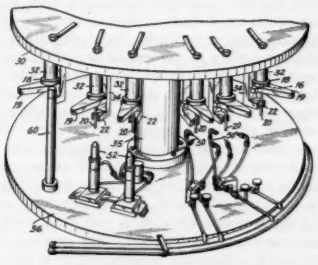
3. a roof member extending between said side members and extending transversely across the top of said channel.

3,884,666

METHOD OF MAKING A CLINICAL MONOCOQUE GLASS THERMOMETER

Seymour N. Blackman, 284 E. Palisades Ave., Englewood, N.Y. 07631

Continuation-in-part of Ser. No. 219,308, Jan. 20, 1972, abandoned. This application Mar. 21, 1974, Ser. No. 453,324
Int. Cl. C03b *9/32*
U.S. Cl. 65—110 **9 Claims**



1. In a method of manufacturing a monocoque clinical glass thermometer having a stem and a bulb formed integrally therewith, that improvement comprising the steps of:

placing a thermometer, blank having a capillary bore therein extending the length thereof in a vertical position, subjecting a portion of said blank adjacent the bottom thereof to heat above the flow temperature of the glass until the heated portion elongates under the force of gravity on said heated portion and on the adjacent portion of the blank beneath the heated portion,

the heated portion stretching until it breaks and the part beneath the break falls off,

the portion of the blank above the break which now is the lower tip of the blank assuming a downwardly tapering conical configuration,

the lower end of the capillary bore being sealed within the upper part of said conical lower tip,

placing the said tip, the glass of which still is hot enough to flow, in a one-piece open-topped die cavity,

introducing gas under pressure into the open upper end of the capillary bore so as to expand the sealed lower end of

the capillary bore into a pocket which forces the glass of the tip downwardly and outwardly as the pocket expands until the outer surface of the tip assumes the configuration of the cavity where the tip engages the walls of the cavity, whereby the side and bottom walls of the bulb formed by the pocket have substantially the same wall thicknesses and the bulb thus formed is in one piece with the remainder of the blank.

3,884,667

TUNNEL FURNACE, AND A METHOD OF OPERATING SAME

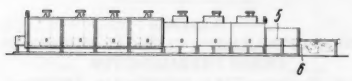
Willem Schraven, Nijmegen, Netherlands, assignor to Smit Nijmegen B.V., Nijmegen, Netherlands

Filed Sept. 17, 1973, Ser. No. 398,020

Claims priority, application Japan, Nov. 29, 1972, 47-117660

Int. Cl. C03b *25/04*

U.S. Cl. 65—119 **3 Claims**



1. A method for the heat treatment of articles comprising transporting said articles in a longitudinal direction through a horizontal tunnel furnace having separate successive sections each with variable temperature controls, controlling the temperature of the air in each of said sections by operating said variable temperature controls, circulating air transversely to the articles traveling in the longitudinal direction to obtain a more uniform air temperature about the articles in each section, drawing air into each section by a selectively controlled air damper and fan means in each section, exhausting air from each section through selectively controlled outlet damper means in each section, sensing the temperature in said sections, inducing a longitudinal flow of air between adjacent sections by varying the pressure between sections, and controlling in accordance with the temperature values in said sections the selective drawing in and exhausting of air from the respective sections to change the pressure between the sections and to induce the longitudinal flow and to provide a uniform and predictable cooling cycle for the articles passing longitudinally through the furnace.

3. A tunnel furnace for cooling articles with a controlled temperature as the articles pass longitudinally through the furnace, said furnace comprising a plurality of successive sections through which articles are transported, conveyor means for transporting the articles in the longitudinal direction through said sections, variable temperature control means in each of said sections for controlling the temperature of air therein, circulating means in each section for circulating the air therein transversely to the articles traveling in the longitudinal direction to obtain a more uniform air temperature about the articles in each section, temperature sensing means for sensing the air temperature within said sections, air inlet and exhaust damper means in each of said sections movable to positions to vary the quantity of cooling air drawn in relative to the quantity of exhaust air expelled, and a control means for positioning said air inlet and exhaust damper means in accordance with temperature values in said sections to induce a longitudinal flow of air between adjacent sections to provide a more uniform and predictable cooling cycle as the articles pass longitudinally through the furnace.

3,884,668

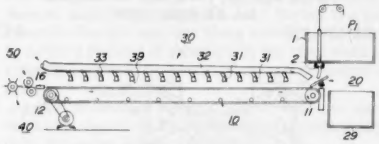
APPARATUS FOR PRODUCING GLASS PELLETS

Kiitiro Suzuki, 64-6, Aza-Yashikiura, and Minoru Hunakawa, 1-banchi, Aza-Maeyama, both of Nishigo-Mura, Nishishirakawa-gun, Hukushima-ken, Japan

Filed Mar. 1, 1974, Ser. No. 447,385

Int. Cl. C03b *19/00, 9/46*

U.S. Cl. 65—142 **10 Claims**



1. Apparatus for continuously mass-producing glass pellets comprising, in combination, a melting furnace having a gravity discharge port; means operable to controllably discharge a continuous stream of molten glass material through said discharge port; an endless chain conveyer constituted by a plurality of pivotally interconnected, V-shape cross-section holder elements, said conveyor having a receiving end beneath said discharge port for receiving, drawing and conveying a continuous length of the glass material discharged through said discharge port; a relatively elongated chilling and guiding means, formed with a glass material guiding groove, situated between said discharge port and the receiving end of said conveyor to receive, chill and guide the continuous length of glass material, and to direct it onto said conveyor; an elongated cooling means arranged above said conveyor and extending throughout the entire conveying length thereof for forcibly cooling the continuous length of glass material conveyed by said conveyor, to form a continuous length of glass material bar; cutting means arranged adjacent a discharge end of said conveyor, said cutting means including a bladed wheel having a plurality of blades operable to successively strike the glass bar continuously discharged from said chain conveyor to cut small pieces, of preselected length, from said glass bar; and glass bar holding means positioned between the discharge end of said chain conveyor and said cutting means and operable to support the glass bar discharged from said conveyor and to supply the glass bar to said cutting means; whereby glass pellets, of uniform length, are continuously formed by said apparatus.

3,884,669

REFRACTORY ELEMENTS

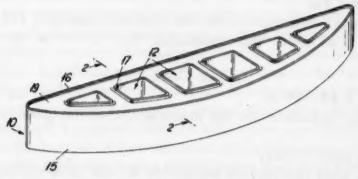
Harry Frederick Friend, Saint Helens, England, assignor to Pilkington Brothers Limited, Liverpool, England

Continuation of Ser. No. 301,407, Oct. 27, 1972, abandoned. This application Sept. 19, 1974, Ser. No. 507,505

Claims priority, application United Kingdom, Nov. 3, 1971, 51173/71

Int. Cl. C03b *5/20*

U.S. Cl. 65—343 **5 Claims**



1. In a refractory element for use in glass making apparatus, having a body of refractory material, and a skin of refractory metal encasing said body, which skin includes an upwardly facing portion covering an upwardly facing surface of the

refractory body which in use would be exposed above molten glass in the apparatus, the improvement comprising refractory metal lip means integral with said skin and extending upwardly above the upper surface of said upwardly facing portion of the skin and located around the periphery of said upwardly facing portion sufficient to retain a static pool of molten glass on top of said upwardly facing portion of the skin.

3,884,670
PLANT GROWTH REGULATORS

Bernd Zeeh, Ludwigshafen; Johann Jung, Limburgerhof, and Hans Joachim Pander, Rodersheim-Gronau, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

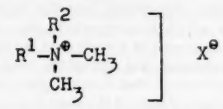
Filed Oct. 13, 1972, Ser. No. 297,364

Claims priority, application Germany, Oct. 28, 1971, 2153600

Int. Cl. A01n *9/20*

U.S. Cl. 71—76 **13 Claims**

1. A process for stunting the growth height of plants which comprises applying to the loci of the plants an effective amount for effecting said stunting of a salt of the formula



where R^1 denotes a cycloalkyl or cycloalkenyl radical having 3 to 5 ring members and which may be substituted by alkyl, R^2 denotes methyl or amino, and X^- denotes a halogen anion.

3,884,671
HERBICIDAL N-HALOACYL (2-ALKYLATED) OXAZOLIDINES

James A. Albright, St. Louis, Mich., and Kenneth P. Dorschner, Vienna, Va., assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 280,851, Aug. 15, 1972. This application July 27, 1973, Ser. No. 383,349

Int. Cl. A01n *9/22*

U.S. Cl. 71—88 **6 Claims**

1. A process for controlling growth of undesirable weeds amongst crop plants which comprises applying to the locus thereof a herbicidally effective amount of an N-(C_{2-4} haloacyl) oxazolidine alkylated in the 2-position with at least one C_{1-12} alkyl group and having the 4 and 5 carbon atom valences satisfied by hydrogen atoms or C_{1-6} alkyl groups.

3,884,672
SYNERGISTIC CHEMICAL CONTROL OF NUTSEDGE WITH COMBINATION OF A 1-METHYL-4-PHENYL-PYRIDINIUM SALT AND A CYCLOPROPYLAMINO-TRIAZINE HERBICIDE

James L. Ahle, Shawnee, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 288,645, Sept. 13, 1972, abandoned. This application Oct. 30, 1973, Ser. No. 411,126

Int. Cl.[2] A01n

U.S. Cl. 71—93 **2 Claims**

1. The method of combating nutsedge consisting of applying post-emergently to the locus of nutsedge plants an effective amount, at least five-eighths lb per acre of a synergistic combination of 1-methyl-4-phenylpyridinium chloride with from 0.1 to 1.0 parts by weight of 2-Chloro-4-cyclopropylamino-6-isopropylamino-s-triazine and an inert carrier.

3,884,673
HERBICIDAL 2-HALO-N-(ACYLOXYALKYLENE) ACETANILIDES

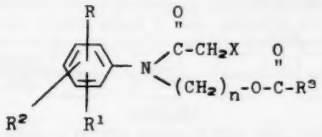
John F. Olin, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 148,894, June 1, 1971, Pat. No. 3,830,829. This application Nov. 30, 1973, Ser. No. 420,423

Int. Cl. A01n *9/24*

U.S. Cl. 71—106 **10 Claims**

1. A herbicidal composition comprising an adjuvant and an effective amount of a compound of the formula



wherein:

R and R^1 are hydrogen, alkyl or alkoxy having at least 1 and not more than 10 carbon atoms and can be like or unlike,

R^2 is hydrogen, alkyl or alkoxy having at least 1 and not more than 10 carbon atoms, NO_2 or halogen,

R^3 is haloaryl or haloaryloxyalkyl having at least 6 and not more than 24 carbon atoms;

X is chlorine, bromine or iodine, and

n is an integer of 1 or 2.

3,884,674
COMPOSITION AND METHOD FOR TREATING PLANTS AND TREES

Roland S. Grybek, and Frederick B. Johnston, both of Tampa, Fla., assignors to Marketing and Research Services, Inc., Coral Gables, Fla.

Continuation-in-part of Ser. Nos. 829,771, June 2, 1969, Pat. No. 3,712,802, Ser. No. 804,717, March 5, 1969, abandoned, and Ser. No. 417,215, Dec. 9, 1964, abandoned. This application Nov. 7, 1972, Ser. No. 304,480The portion of the term of this patent subsequent to Nov. 27, 1988, has been disclaimed.

Int. Cl. A01n *9/24*

U.S. Cl. 71—113 **1 Claim**

1. The method of synchronizing maturity of fruiting bodies of tomato plants comprising applying to said fruit bearing plants about 0.5 to 1.0 milligrams per plant of an aqueous solution of equal parts by weight of α-keto phenyl acetic acid, β-hydroxy pyruvic acid, α-keto-β-hydroxy butyric acid, and p-hydroxy phenyl pyruvic acid.

3,884,675
PRODUCTION OF TITANIUM COMPOUNDS FROM ORES CONTAINING OXIDES OF TITANIUM AND IRON

Joseph Thomas Pullukattu, and Mathew Mathew Pulimoottil, both of Kerala, all of India, assignors to Kerala State Industrial Development Corporation, Kerala, India

Continuation of Ser. No. 42,478, June 1, 1970, abandoned. This application Sept. 11, 1972, Ser. No. 287,918

Int. Cl. C01g *23/08*

U.S. Cl. 75—1 **9 Claims**

1. A process for the production of titanium dioxide from ores principally containing mixed oxides of titanium and iron which comprises roasting the ore in air in powdered form at a temperature above 1000°C. to form the iron oxide into ferric oxide, mixing said roasted ore with twice its volume of a dense form of carbon, heating said mixture to a temperature of from 700°–900°C. in the absence of air to obtain a homogeneous mass reactable with chlorine to less than 0.1% iron contamination, powdering said mass, roasting said powdered mass in air

to form titanium dioxide and separating the remainder of the mass from the titanium dioxide.

3,884,676

DISPERSION STRENGTHENING OF METALS BY IN-CAN PROCESSING

Anil V. Nadkarni, Baltimore, and Erhard Klar, Pikesville, both of Md., assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 217,506, Jan. 13, 1972, Pat. No. 3,779,714. This application June 27, 1973, Ser. No. 373,998

Int. Cl. B22f *1/04*

U.S. Cl. 75—.5 BC **8 Claims**

1. A self-contained powder metal mixture adapted to be dispersion strengthened by internal oxidation and extruded under heat and pressure, the self-contained powder metal mixture comprising:

an intimate mixture of 100 weight parts of a powdered alloy and at least about 0.1 weight parts of an oxidant, said powdered alloy having an average particle size of less than 300 microns and consisting of a relatively noble matrix metal having a negative free energy of oxide formation at 25°C of up to 70 kilocalories per gram atom of oxygen, and a solute metal having a negative free energy of oxide formation exceeding the negative free energy of oxide formation of said matrix metal by at least about 60 kilocalories per gram atom of oxygen at 25°C, said oxidant consisting of an intimate mixture of heat-reducible metal oxide having a negative free energy of formation at 25°C of up to 70 kilocalories per gram atom of oxygen, and finely divided hard, refractory metal oxide having a negative free energy of formation exceeding the negative free energy of formation of said heat-reducible metal oxide by at least about 60 kilocalories per gram atom of oxygen at 25°C;

said heat-reducible metal oxide being present in substantially stoichiometric proportion for complete oxidation of said solute metal in said alloy whereby a residue of heat-reducible metal oxide remains in said powder metal mixture after internal oxidation adapted to be dispersion strengthened during coalescence by said hard, refractory metal oxide; and

a metal container comprising side wall portions, a forward wall, and a rearward wall, said walls defining a cavity within said metal container for containing said powder metal mixture of alloy and oxidant free from contamination during internal oxidation and extrusion whereby said powder metal mixture is adapted to be dispersion strengthened within said metal container and directly extruded from said metal container.

3,884,677

BLAST FURNACE OPERATING METHODS

Werner Wenzel; Heinrich Wilhelm Gudenau, and Tsutomu Fukushima, all of Aachen, Germany, assignors to Nippon Kokan Kabushiki Kaisha, Japan

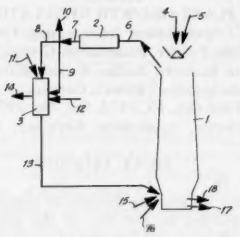
Filed Nov. 20, 1973, Ser. No. 417,622

Claims priority, application Germany, Nov. 25, 1972, 2257922; Mar. 8, 1973, 2311466

Int. Cl. C21b *5/06*

U.S. Cl. 75—42 **15 Claims**

1. In a blast furnace operating method for producing metal comprising providing a blast furnace having an hearth, stack and top, charging said blast furnace with ore and coke, introducing a blast into the hearth of the blast furnace, introducing a reducing gas into the stack of the blast furnace, reducing the ore to form metal and simultaneously producing blast furnace gas, recovering the metal and discharging all of the blast furnace gas from the top of the blast furnace, the improvement in combination therewith comprising the steps of regenerating a first portion of blast furnace gas issuing from the top of a blast furnace by means of fossil fuel into a condition where it is enriched with carbon monoxide and hydrogen, utilizing a second portion of the blast furnace gas as at least part of a source of heat for regenerating the first portion of the



blast furnace gas, introducing into the hearth of the blast furnace a blast which is substantially free of nitrogen and which is made up in part of a portion of the regenerated blast furnace gas, preheating that part of the blast which does not include the regenerated blast furnace gas at least partly with the residual portion, if any, of the blast furnace gas remaining after said first and second portions are taken therefrom, and simultaneously introducing the remainder of the regenerated blast furnace gas, which does not form part of the blast, into the stack.

3,884,678

FLUXES

Ramachandra K. Iyengar, Mt. Lebanon, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Feb. 4, 1974, Ser. No. 439,465

Int. Cl. C21c *7/00*; **C22b** *9/10*

U.S. Cl. 75—52 **6 Claims**

1. A solid solution of flux consisting essentially of 28 to 32% MnO, 30 to 35% FeO, 25 to 30% CaO and 8 to 12% MgO.

3,884,679

METHOD OF PREPARING A STABLE MIXTURE OF CALCIUM WITH A COMPOUND YIELDING WATER AT ELEVATED TEMPERATURE

Rudolf Mitteldorf; Erich Pfluger, and Werner Steinicke, all of Trostberg, Germany, assignors to Suddeutsche Kalkstickstoff-Werke Aktiengesellschaft, Trostberg, Upper Bavaria, Germany

Filed May 13, 1974, Ser. No. 469,624

Claims priority, application Germany, May 24, 1973, 2326539

Int. Cl. C21c *7/00*

U.S. Cl. 75—53 **9 Claims**

1. A method of producing a stable desulfurizing composition for molten metal which comprises:

a. mixing particulate calcium carbide with a compound solid at 20°C,

said compound yielding water when heated in the presence of calcium carbide to a temperature above 250°C while being stable in air at temperatures below 250°C; and

b. grinding the resulting mixture at 50°C to 250°C in an atmosphere inert to said calcium carbide and to said compound to a particle size not greater than 2 mm,

the amount of calcium carbide in said mixture being between 50 and 97% of the combined weight of said calcium carbide and of said compound.

3,884,680
AUTOMATICALLY CONTROLLING THE OXYGEN CONTENT IN COPPER AND COPPER ALLOYS

Edouard De Bie, Antwerpen, Belgium, assignor to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Filed Aug. 15, 1972, Ser. No. 280,918

Claims priority, application Luxembourg, Aug. 31, 1971, 63808

Int. Cl. C22b *15/00*

U.S. Cl. 75—72 **1 Claim**

1. A process for maintaining the oxygen content of a molten copper or copper alloy at a desired value in a furnace heated by burners supplied with a gaseous fuel and an oxygen-containing combustive gas selected from the group consisting of air, oxygen-enriched air and oxygen which comprises:

a. maintaining the ratio between the intake pressures of the gaseous fuel and the oxygen-containing gas to each burner at a fixed value,

b. heating a portion of the gaseous fuel that is conducted to each burner and not heating another portion,

c. heating a portion of the oxygen-containing gas that is conducted to each burner and not heating another portion,

d. continuously measuring the oxygen content of the molten copper or copper alloy by electrochemical means so as to generate an electrical signal,

e. comparing the electrical signal generated by step (d) with an electrical signal which corresponds to the desired oxygen content of the molten copper or copper alloy and generating an electrical signal proportional to the difference therebetween,

f. continuously measuring the temperature of the gaseous fuel that enters each burner,

g. continuously measuring the temperature of the oxygen-containing gas that enters each burner,

h. comparing the difference in the measured temperature of the gaseous fuel and the measured temperature of the oxygen-containing gas, and converting this measured difference into an electrical signal, and

i. adjusting the volume of the unheated portion of either the gaseous fuel or the oxygen-containing gas in proportion to the difference between the magnitude and polarity of the electrical signal generated by step (e) and the electrical signal generated by step (h).

3,884,681
PROCESS FOR THE PRODUCTION OF HIGH-PURITY METALS FROM NICKELIFEROUS MATTES

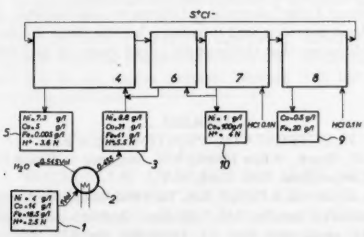
Louis Gandon, Rambouillet, France, assignor to Le Nickel, Paris Cedex 15, France

Filed Nov. 28, 1973, Ser. No. 419,534

Claims priority, application France, Dec. 1, 1972, 72.42775

Int. Cl. C22d *1/14*; **C22b** *3/00*

U.S. Cl. 204—113 **7 Claims**



1. In a method for producing high-purity nickel from impure nickel matte containing cobalt and other impurities comprising successively the following steps: a) comminuting and roasting said impure matte at a temperature of about 900°C to obtain impure nickel oxide; (b) dissolving this impure nickel oxide in concentrated hydrochloric acid; c) oxidizing to the ferric state the iron which is contained in the impure solution resulting from the preceding step; (d) removing the impurities from this solution by means of ion-exchange resin to produce a purified nickel chloride solution and selectively eluting said impurities to recover a cobalt chloride solution; and e) subjecting the purified nickel chloride solution to an electrolysis to recover high-purity nickel; the improvement according to which said ion-exchange resin containing said impurities is eluted with approximately decinormal hydrochloric acid, the eluate obtained is concentrated and then contacted with an organic phase in a first liquid-liquid extraction to yield an at least partly purified aqueous solution of nickel and cobalt chlorides, the organic phase is washed and then subjected to cobalt re-extraction to produce an aqueous solution rich in cobalt, the organic phase is then subjected to iron re-extraction and then recycled to said first liquid-liquid extraction.

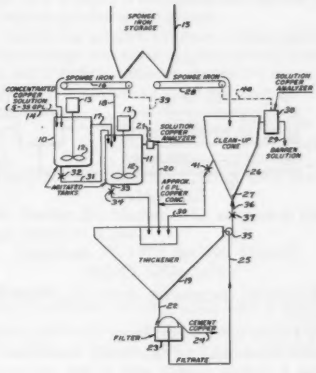
3,884,682
RECOVERING COPPER FROM ACIDIC SOLUTIONS BY CONTINUOUS CEMENTATION

William A. Griffith; Howard E. Day, both of Osburn, Idaho; Clarence A. Lefler, Casa Grande, Ariz., and Stephen M. Cottam, Osburn, Idaho, assignors to Hecla Mining Company, Wallace, Idaho

Filed Apr. 6, 1973, Ser. No. 348,586

Int. Cl. C22h *15/12*

U.S. Cl. 75—109 **6 Claims**



1. The method of recovering solid copper metal from a flowing dilute acidic copper solution containing greater than 5 grams per liter of dissolved copper in the form of salts to produce solid cement copper and substantially copper free barren solution, comprising: continuously contacting said flowing solution with iron to form a mixture of a low copper content solution having a maximum dissolved copper content of approximately 1 gram of copper in the form of dissolved salts per liter of solution and solid copper particles; directing said mixture of low copper content solution and copper particles to a thickener; continuously separating in said thickener said solid copper particles from said resulting low copper content solution; then contacting said resulting low copper content solution with additional iron in a clean up step to precipitate substantially all of the remaining dissolved copper from said resulting low copper content solution to form more solid cement copper and the substantially copper free barren solution; directing said precipitated remaining copper with a portion of said barren solution into said thickener; and discarding the remaining said barren solution from said solution clean up step.

3,884,683

NOVEL SUPERCONDUCTING MATERIAL

Ushio Kawabe, Hamura; Shigeo Fukase; Masato Ishibashi both of Hachioji; Mitsuhiro Kudo, Hamura, and Kazue Takatoku, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 24, 1972, Ser. No. 220,211
Claims priority, application Japan, Jan. 22, 1971, 46-1584
Int. Cl. C22c *27/00*; C22f *1/18*; H01f *1/04*
U.S. Cl. 75—174 14 Claims

1. A superconducting material consisting essentially of an intermetallic compound having a β-W type crystal structure represented by the formula:

$$(Nb_{1-x}Ta_x)_kAl_{1-y}M_y ,$$

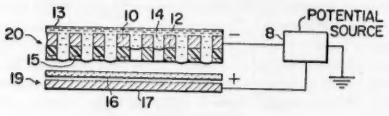
wherein M is an element selected from the group consisting of Be, and Si and the values of x, y, and k are $0 \leqq x \leqq 0.1$, $0.01 \leqq y \leqq 0.2$, and $2.3 \leqq k \leqq 4.0$, respectively.

3,884,684

ELECTROSTATIC DEVELOPING PROCESS EMPLOYING A POROUS PHOTOCONDUCTIVE MEMBER

Genji Ohno, Yokohama, and Eiichi Inoue, Tokyo, both of Japan, assignors to Research and Development Laboratories of Ohno Co., Ltd., Kanagawa, Japan

Division of Ser. No. 233,547, March 10, 1972, Pat. No. 3,776,630. This application Apr. 23, 1973, Ser. No. 353,799
Claims priority, application Japan, Mar. 29, 1971, 46-17940
Int. Cl. G03g *13/10*
U.S. Cl. 96—1 LY 11 Claims



1. A method for electrostatic developing which comprises the steps of:

forming a latent electrostatic image on a composite transfer member comprising an electrically conductive substrate having a surface coated with a thin photoconductive layer, said transfer member having uniformly distributed fine pores disposed therethrough, and said photoconductive layer being repellent to aqueous liquids;

applying to said composite transfer member opposite said photoconductive layer a developer liquid comprising toner in an aqueous carrier to provide developer liquid in the pores of said substrate adjacent said photoconductive layer, said aqueous developer liquid establishing a contact angle with said photoconductive layer in said pores of greater than 90°;

advancing an absorbent printing member in contact with the photoconductive member bearing the latent electrostatic image;

applying a D.C. voltage between the electrically conductive substrate of the composite transfer member and electrode means adjacent the printing member on opposite side from said transfer member to decrease the contact angle of said aqueous liquid developer in said pores to less than 90°;

flowing aqueous liquid developer through said pores onto said printing member in selected areas corresponding to the latent electrostatic image; and

separating said printing member from said transfer member

3,884,685

LOW DENSITY PAPER USED IN TRANSFER ELECTROPHOTOGRAPHY

Charles J. Green, Jr.; George Treier, and Robert H. MacClaren, all of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 98,883, Dec. 16, 1970, which is a continuation-in-part of Ser. No. 50,886, June 29, 1970, abandoned. This application Dec. 6, 1973, Ser. No. 422,452
Int. Cl. G03q *13/22*
U.S. Cl. 96—1.4 3 Claims

1. A method of electrophotographically copying comprising:

a. charging an electrophotographic plate;

b. exposing the charged electrophotographic plate to activating radiation to create an electrostatic image;

c. developing the resulting electrostatic image with electroscopic marking particles; and

d. transferring said developed image to an electrophotographic copy paper comprising paper making fibers having incorporated therein a low density bulking material in a proportion of up to about 10 percent by weight of the paper making fibers, and a surface size on said bulked paper having a composition comprising binder material, a metallic sulfate salt which imparts conductivity to the paper, in an amount of from about 1 to 50 percent by weight based on said binder, and clay in an amount of from about 40 to 50 percent of the total composition, the combination of salt and clay not exceeding 60 percent of the total composition.

3,884,686

COLOR CORRECTION METHOD

Lloyd F. Bean, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 213,088, Dec. 28, 1971, abandoned. This application Oct. 26, 1973, Ser. No. 409,978
Int. Cl. G03g *13/22*
U.S. Cl. 96—1.4 23 Claims

1. A method for obtaining a color corrected electrostatic latent image comprising the steps of:

a. providing a xerographic member comprising an electrically insulating layer overlying a photoconductive insulating layer which overlies a conductive substrate;

b. applying a first electrostatic charge to said member;

c. imagewise exposing said member to an original color image through a filter of a first primary color;

d. applying a second electrostatic charge to said member, said second charge having a polarity opposite to that of said first charge;

e. imagewise exposing said member to said original color image through a filter of a second primary color, said second primary color being complementary to the color information of said original image which is represented by the electrostatic latent image being formed;

f. applying a third electrostatic charge to said member; and

g. flood exposing said member whereby there is formed a color corrected electrostatic latent image on said member.

3,884,687

ELECTROSTATIC PRINTING PROCESS

Donald W. Breck, White Plains, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 527,065, Feb. 14, 1966, abandoned, which is a division of Ser. No. 166,948, Jan. 17, 1962, abandoned. This application Nov. 13, 1969, Ser. No. 871,285
Int. Cl. D21h *3/66*; G03g *7/00*
U.S. Cl. 96—1.4 2 Claims

1. In an electrostatic printing process the improvement which comprises applying a uniform layer of photoconductive insulating material to an electrically conductive paper backing provided with a sufficient amount of crystalline zeolite mate-

rial to impart to such paper an electrical resistivity of less than 1×10^{12} ohm-cm over the range of relative humidity of from 5 to 90%; developing a strong electrostatic charge on the surface of said layer; exposing the charged layer to light source to render the illuminated areas thereof sufficiently conductive to drain off a substantial portion of said charge to said electrically conductive paper backing; then contacting a fine dust with the surface whereby to form an electrostatic dust deposit on the areas of said surface remaining charged after exposure and removing excess dust not electrostatically held on said surface.

3,884,688

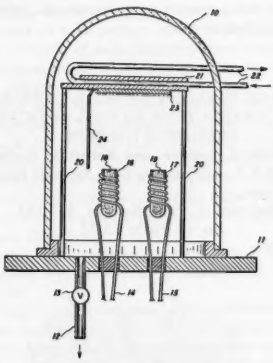
PHOTOSENSITIVE ELEMENT EMPLOYING A VITREOUS BISMUTH-SELENIUM FILM

John C. Schottmiller; Francis W. Ryan, both of Penfield, N.Y., and Charles Wood, Sycamore, Ill., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 798,750, Feb. 12, 1969, abandoned, which is a continuation-in-part of Ser. No. 674,267, Oct. 10, 1967, Pat. No. 3,627,573, which is a continuation-in-part of Ser. No. 550,225, May 16, 1966, abandoned. This application Jan. 5, 1973, Ser. No. 321,194The portion of the term of this patent subsequent to Dec. 14, 1988, has been disclaimed.

Int. Cl. G03g *5/04*

U.S. Cl. 96—1.5 **2 Claims**



1. A photosensitive element exhibiting infrared sensitivity and adapted for use in a vidicon device, said element comprising an electrically conductive supporting substrate having thereon a vitreous bismuth-selenium film which comprises about 2.0 to 4.0 atomic percent bismuth with the balance comprising selenium.

3,884,689

POLYCYCLIC AROMATIC POLYMER AS A PHOTOCONDUCTOR OR OVERLAYER

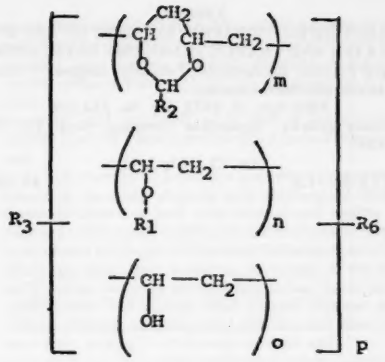
William W. Limburg, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1973, Ser. No. 393,082

Int. Cl. G03g *5/06*

U.S. Cl. 96—1.5 **14 Claims**

1. A photoconductive member comprising a substrate and at least one organic photoconductive layer comprising an aromatic polyvinyl polymer of the formula



wherein

R_1 is defined as a hydrogen atom, a lower alkyl group or as a lower alkyl carbonyl group;

R_2 is an aromatic polycyclic radical having 4–5 fused ring nuclei; or a 3 ringed N-containing heterocyclic group

R_3 and R_6 are polymeric end groups;

m, *n*, *o* and *p* are positive numbers commensurate with a number average molecular weight of at least about 5,000; *m*, *n*, and *o* falling within the respective ratios of about 1–6:0–1:1–8 in random or block polymers.

3,884,690

POLYESTER PHOTOCONDUCTORS AND MATRIX MATERIALS

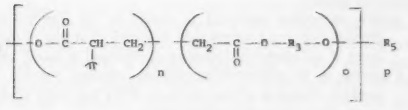
Richard W. Radler, Jr., Marion, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 27, 1973, Ser. No. 401,468

Int. Cl. G03g *5/06*

U.S. Cl. 96—1.5 **6 Claims**

1. A photoconductive member comprising a substrate and at least one organic photoconductive layer comprising hole-generating photoconductive material and a polyester of the formula



wherein π is defined as a pyrene; a benzopyrene, a chrysene, a dibenzanthracene, a perylene, a picene, a tetracene, a fluorene, a phenanthrene, an anthraquinone or a thiophene group;

R_3 is defined as a divalent polycyclic aryl group or as a straight or branched methylene chain of from 1 – 20 carbon atoms;

R_4 and R_5 are individually defined as polymeric end groups;

n and *o* are integers in a ratio of about 1–3:1; and

p is an integer commensurate with a number average molecular weight of about 5,000 – 100,000.

3,884,691
ELECTROPHOTOGRAPHIC ELEMENT OF AZO DYE LAYER AND CHARGE TRANSPORT OVERLAYER

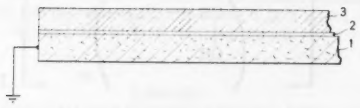
Jürgen Rochlitz, Breckenheim, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Apr. 25, 1973, Ser. No. 354,319

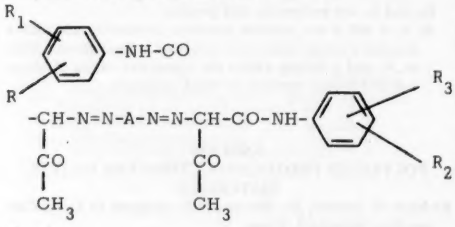
Claims priority, application Germany, Sept. 21, 1972, 2226254

Int. Cl. G03g *5/06*

U.S. Cl. 96—1.6 **19 Claims**



1. Electrophotographic recording material comprising an electroconductive support material and a photoconductive double layer of organic materials composed of a tightly packed, homogeneous, uniform, opaque charge carrier producing dyestuff layer and a transparent top layer of insulating materials containing at least one charge transporting compound, in which the organic dyestuff layer is composed of a compound of the general formula



wherein

—A— is a diphenyl, 2-phenyl-benzimidazole or azobenzene group which may be substituted, and

R, R_1, R_2 and R_3 may be the same or different and are hydrogen, alkyl with one to four carbon atoms, alkoxy with one to four carbon atoms, or halogen,

and in which the transparent top layer is composed of a mixture of a binder with a charge transporting, monomeric, heterocyclic compound substituted by at least one dialkyl-amino group or two alkoxy groups and having an extended π-electron system,

which recording material is useful in an electrophotographic copying process with negative charging of the top layer if an electron-donating compound is used, and is useful in an electrophotographic copying process with positive charging of the top layer if the top layer contains an electron-accepting compound.

3,884,692
PHOTOGRAPHIC SUPPORT

Nobuhiko Minagawa, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 13, 1973, Ser. No. 340,790

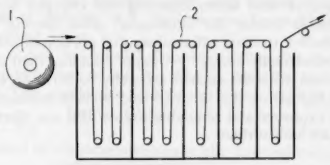
Claims priority, application Japan, Mar. 14, 1972, 47-25881

Int. Cl. G03c *1/86*

U.S. Cl. 96—85 **14 Claims**

1. A photographic light-sensitive material comprising

a. a support which comprises a polyolefin-laminated paper having on its back a coating layer composed of fibrous colloidal alumina (hydrate), and



b. a silver halide emulsion layer on the side of said support opposite the alumina coated side.

3,884,693
LIGHT-SENSITIVE TRANSFER MATERIAL

Sigrid Bauer, Hahn, Taunus, and Helga Sikora, Wiesbaden-Biebrich, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed May 8, 1972, Ser. No. 251,351

Claims priority, application Germany, May 13, 1971, 2123702

Int. Cl. G03c *11/12, 7/16*

U.S. Cl. 96—15 **14 Claims**

1. Light-sensitive transfer material comprising a support, a light-sensitive thermoplastic layer, and a thin intermediate release layer of low permeability to the oxygen of the air which does not become tacky when heated at temperatures up to 150°C. and has a greater adhesion to said light-sensitive layer than to said support.

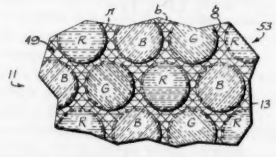
3,884,694
PROCESS FOR FORMING A COLOR CATHODE RAY TUBE SCREEN STRUCTURE HAVING OPTICAL FILTER ELEMENTS THEREIN

Anthony V. Gallaro, Auburn, and Robert A. Hedler, Seneca Falls, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 2, 1973, Ser. No. 412,142

Int. Cl. G03g *13/22*

U.S. Cl. 96—30 **8 Claims**



2. In the viewing panel of a color cathode ray tube whereon a patterned screen structure formed of first, second and third pattern elements in disposed on the interior surface of said panel relative to a multiple apertured pattern mask spatially positioned adjacent thereto, an improved process for forming an improved multi-windowed screen structure defined by a webbing of uniform opaque interstices disposed on the interior surface of said panel prior to the fabrication of the phosphor screen thereon, each of said windows defining an area of a selected substantially transparent optical filter material and evidencing a peripheral shaping free of indentations similar to that of the respective formative aperture in said pattern mask, said improved process comprising the steps of:

coating the interior of said panel with a uniform layer of a protective coating formed of a negative photosensitive resist material admixed with an inert substance;

exposing said coated panel by directing actinic radiations emanating from two spaced apart positions through the apertures in said pattern mask to light-polymerize those portions of said photosensitive coating mixture in the areas subsequently occupied by said second and third filter pattern windows;

developing said light exposed panel coating by removing the unexposed photosensitive coating mixture therefrom to provide second and third polymerized filter pattern window elements on the bare glass of said panel;

overcoating said patterned panel with a uniform liquid primary layer of a heat formable first optical filter material;

heating said overcoated panel in a controlled oxygen atmosphere to thermally degrade said polymerized window elements formed of said resist mixture and oxidize said first optical material and adhere a substantially continuous and transparent primary layer of said first optical filter material to the glass surface of said panel, said primary layer having defined second and third filter pattern window areas therein wherein said degraded mixture and associated first filter materials are loosely retained;

treating said panel to remove said loosely retained materials from said second and third filter pattern window areas to provide a primary layer of said first optical filter material having second and third pattern open filter windows therein;

coating said panel with a uniform layer of said protective coating formed of said negative photoresist material admixed with said inert substance;

exposing said coated panel by directing actinic radiations emanating from two spaced apart positions through the apertures of said pattern mask to light-polymerize discrete portions of said photosensitive coating mixture in those areas subsequently occupied by said first and third filter pattern windows;

developing said light-exposed panel coating by removing the unexposed photosensitive mixture therefrom to provide a plurality of first polymerized filter pattern elements superimposed on said first optical filter material in a manner to define the first filter pattern window areas, and a plurality of third polymerized filter pattern elements disposed in the open third pattern window areas of said primary filter layer;

overcoating said patterned panel with a uniform liquid secondary layer of a heat formable second optical filter material;

heating said overcoated panel in a controlled oxygen atmosphere to thermally degrade said polymerized window elements formed of said resist mixture and oxidize and adhere a substantially continuous and transparent secondary layer of said second optical filter material to portions of said primary filter layer including deposition in the second filter pattern windows thereof, said secondary layer having defined first and third filter pattern window areas therein wherein said degraded mixture and associated second filter materials are loosely retained;

treating said panel to remove said loosely retained materials from said first and third filter window areas whereupon said primary filter layer is covered with said secondary layer of the second optical filter material having first and third pattern open filter windows therein;

coating said panel with a uniform layer of said protective coating formed of said negative photoresist material admixed with said inert substance;

exposing said coated panel by directing actinic radiations emanating from two spaced apart positions through the apertures in said pattern mask to light polymerize discrete portions of said photosensitive coating mixture in those areas subsequently occupied by said first and second filter pattern windows;

developing said light exposed panel coating by removing the unexposed photosensitive coating mixture therefrom to provide a plurality of first polymerized filter pattern elements deposed in said open first pattern window areas of said secondary filter layer, and a plurality of second polymerized filter pattern elements disposed in the open second pattern window areas of said secondary filter layer;

overcoating said patterned panel with a uniform liquid tertiary layer of a heat formable third optical filter material;

heating said overcoated panel in a controlled oxygen atmosphere to thermally degrade said polymerized window elements formed of said resist mixture and oxidize and adhere a substantially continuous and transparent tertiary layer of said third optical filter material to portions of said secondary filter layer including deposition in the third filter pattern windows thereof, said teritary layer having defined first and second filter pattern window areas therein wherein said degraded mixture and associated third filter materials are loosely retained; and

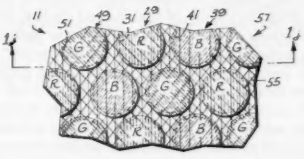
treating said panel to remove said loosely retained materials from said first and second filter pattern window areas whereupon the secondary filter layer is recovered with said tertiary layer of a third optical filter material having first and second pattern open filter windows therein, the combination of said superimposed primary, secondary and tertiary filter layers provides a substantially opaque uniformly structured interstitial webbing fully surrounding each of the respective optical filter windows in said screen structure whereof the uniform peripheral encompassment of each filter window is free of indentations.

3,884,695

PROCESS FOR FABRICATING A COLOR CATHODE RAY TUBE SCREEN STRUCTURE HAVING SUPERIMPOSED OPTICAL FILTER MEANS THEREIN

Anthony V. Gallaro, Auburn, and Robert A. Hedler, Seneca Falls, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 2, 1973, Ser. No. 412,144
Int. Cl. G03g *13/22*
U.S. Cl. 96—30 **4 Claims**



1. In the viewing panel of a color cathode ray tube whereon a patterned cathodoluminescent screen formed of green-emitting, blue-emitting, and red-emitting phosphor elements is disposed relative to a multiple apertured pattern mask spatially positioned adjacent thereto, an improved process for forming an improved multi-windowed screen structure defined by a webbing of uniform opaque interstices disposed on an interior surface of said panel prior to the fabrication of said patterned phosphor screen thereon, said windows being definitive of dual-layered optical filter components formed of superimposed selected transparent optical filter materials and evidencing peripheral shapings free of indentations similar to those of the respective formative apertures in said pattern mask, said process improvement comprising the steps of:

coating the interior of said panel with a uniform layer of a protective coating formed of a negative photosensitive resist material admixed with an inert substance;

exposing said coated panel by directing actinic radiation emanating from a first exposure position through the apertures in said pattern mask to light polymerize those portions of said photosensitive coating mixture in the

areas subsequently occupied by said first filter pattern windows;

developing said light-exposed panel coating by removing the unexposed photosensitive mixture therefrom to provide polymerized first filter pattern window elements on the bare glass of said panel;

overcoating said patterned panel with a uniform liquid primary layer of a heat formable first optical filter material;

heating said overcoated panel in a controlled oxygen atmosphere to thermally degrade said polymerized first window elements formed of said resist mixture and oxidize said first optical filter material and adhere a substantially continuous and transparent primary layer of said first optical filter material to the glass surface of said panel, said primary layer having defined first filter pattern window areas therein wherein said degraded mixture and associated first filter materials are loosely retained;

treating said panel to remove said loosely retained materials from said first filter pattern window areas to provide a primary layer of first optical filter materials having a first pattern open filter windows therein;

coating said panel with a uniform layer of said protective coating formed of said negative photoresist material admixed with said inert substance;

exposing said coated panel by directing actinic radiation emanating from a second exposure position through the apertures of said pattern mask to light-polymerize discrete portions of said photosensitive coating mixture in those areas subsequently occupied by said second filter pattern windows;

developing said light exposed panel coating by removing the unexposed photosensitive mixture therefrom to provide a plurality of second polymerized filter pattern elements superimposed on said first optical filter material in a manner to define the second filter pattern window areas; overcoating said patterned panel with a uniform liquid secondary layer of a heat formable second optical filter material;

heating said overcoated panel in a controlled oxygen atmosphere to thermally degrade said polymerized second window elements formed of said resist mixture and oxidize and adhere a substantially continuous and transparent secondary layer of said second optical filter material to portions of said primary filter layer including deposition in the first filter pattern windows thereof, said secondary layer having defined second filter pattern window areas therein wherein said degraded mixture and associated second filter materials are loosely retained;

treating said panel to remove said loosely retained materials from said second filter window areas whereupon areas of said primary filter layer are evidenced through said open second filter pattern windows;

coating said panel with a uniform layer of said protective coating formed of said negative photoresist material admixed with said inert substance;

exposing said coated panel by directing actinic radiation emanating from a third exposure position through the apertures in said pattern mask to light-polymerize discrete portions of said photosensitive coating mixture in those areas subsequently occupied by said third filter pattern windows;

developing said light exposed panel coating by removing the unexposed photosensitive mixture therefrom to provide a plurality of polymerized third filter pattern elements disposed on said secondary filter layer;

overcoating said patterned panel with a uniform liquid tertiary layer of a heat formable third optical filter material;

heating said overcoated panel in a controlled oxygen atmosphere to thermally degrade said polymerized third window elements formed of said resist mixture and oxidize and adhere a substantially continuous and transparent tertiary layer of said third optical filter material to portions of said secondary filter layer including deposition in the second filter pattern windows thereof, said tertiary layer having defined third filter pattern window areas therein wherein said degraded mixture and associated third filter materials are loosely retained; and

treating said panel to remove said loosely retained materials from said third filter pattern window areas whereupon areas of said secondary filter layer superposed on said primary filter layer are evidenced through said open third filter pattern windows, areas of said tertiary filter layer superposed on said primary filter layer being evidenced and defined by said second filter pattern windows, areas of said tertiary filters layers superposed on said secondary filter layer being evidenced and defined by said first filter pattern windows; said first, second and third dual-layered filter pattern areas being associated with specific color-emitting phosphor elements to provide enhanced selective optical filtering thereof, the combination of said superimposed filter layers provide an opaque uniformly structured interstitial webbing fully surrounding each of the respective optical filter windows in said screen structure, the uniform peripheral encompassment of each filter window being free of indentations provides an optimized area for display of a respective color emission.

3,884,696

POSITIVE PHOTORESIST COMPRISING POLYSULFONES FORMED BY REACTING VINYL AROMATIC HYDROCARBONS WITH SULFUR DIOXIDE

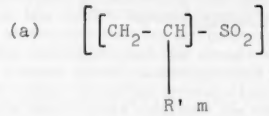
Murrae John Stanley Bowden, Chatham, and Edwin Arthur Chandross, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 5, 1974, Ser. No. 448,399

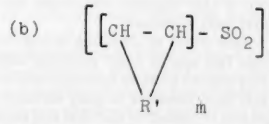
Int. Cl. G03c *5/00;* **B01j** *1/10, 1/12*

U.S. Cl. 96—35 **5 Claims**

1. The method of forming a patterned resist on the surface of a substrate which comprises exposing a portion of an arylated polysulfone film on said substrate to ultraviolet radiation having a wavelength within the range of 1,700–4,000 A for a time period sufficient to lower the molecular weight of the polysulfone, and selectively removing the exposed portion from said substrate, said polysulfone being selected from the group consisting of

(a) 

and

(b) 

wherein *m* is an integer having a value of at least 1, R is an aromatic hydrocarbon radical selected from the group consisting of phenyl, biphenyl, naphthyl, phenanthyl, fluoroanthryl and anthracyl radicals and R′ is a 1,8 naphthylidene radical.

3,884,697

PHOTOGRAPHIC PROCESS UTILIZING SPIROPYRAN COMPOUND DISPERSED IN NITROCELLULOSE FILM WITH HIGH NITROGEN CONTENT

Eiichi Inoue, and Mitsunobu Nakazawa, both of Tokyo, Japan, assignors to Eiichi Inoue, Japan; Dai Nippon Insatsu Kabushiki Kaisha, Japan and Canon Kabushiki Kaisha, Japan, part interest to each

Division of Ser. No. 256,570, May 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 20,410, March 17, 1970, abandoned. This application Mar. 19, 1974, Ser. No. 452,516

Claims priority, application Japan, Mar. 31, 1969, 44-23819

Int. Cl. G03c *5/24*

U.S. Cl. 96—48 R **2 Claims**

1. A method for producing a reversible color change image by the use of a reverse photochromic film consisting essentially of nitrocellulose having a nitrogen content of from about 10 to 12.2% by weight and a molecular weight of about 10,000 to 250,000 and a spiro-pyran compound being present in an amount of about 1 part by weight per 60 parts by weight nitrocellulose, said method comprising (i) decoloring said reverse photochromic film, which is originally colored and in a stable state, by subjecting it to irradiation with visible light to form an image, and (ii) restoring the decolored image to the original color by subjecting the film to irradiation with ultraviolet light or by placing the film in the dark.

3,884,698

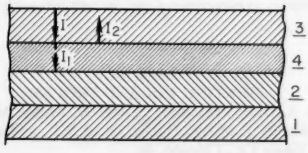
METHOD FOR ACHIEVING UNIFORM EXPOSURE IN A PHOTOSENSITIVE MATERIAL ON A SEMICONDUCTOR WAFER

Sanehiko Kakihama, and Edward B. Stoneham, both of Los Altos, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 23, 1972, Ser. No. 283,143

Int. Cl. B44d *1/16, 1/18*

U.S. Cl. 117—217 **3 Claims**



1. A method of preparing a substrate for transfer of a pattern to said substrate from a mask imprinted with said pattern, said method comprising:

depositing an insulating layer of one or more solid insulating materials onto said substrate;

depositing an antireflection layer of one or more solid materials onto said insulating layer; and

depositing a layer of photosensitive material onto said antireflection layer, the thickness of said antireflection layer and the thickness of said insulating layer being chosen to achieve cancellation among light waves reflected back into said photosensitive layer from the other layers.

3,884,699

PHOTOGRAPHIC MATERIALS HAVING REDUCED STATIC CHARGEABILITY AND METHOD FOR THEIR PRODUCTION

Elio Cavallo, Carcare, and Fulvio Furlan, Savona, both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 18, 1973, Ser. No. 380,410

Claims priority, application Italy, July 24, 1972, 51726/72

Int. Cl. G03c *1/06*

U.S. Cl. 96—87 A **28 Claims**

1. A method for reducing the chargeability of photographic layers, upon a support, which essentially consist of a hydrophylic colloidal binder comprising gelatin, said method consisting of introducing at least one surfactant having a substantially fluorinated cation or anion bonded to a hydrophilic group and at least one of a nonfluorinated betaine or N-oxide surfactant into said layers by mixing the hydrophilic colloidal binder and surfactants prior to formation of the photographic layer containing the surfactants.

3,884,700

SILVER HALIDE EMULSIONS CONTAINING TWO-EQUIVALENT BENZOYLACETANILIDE PHOTOGRAPHIC COUPLERS

Andrea Quaglia, Albisola Mare, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 26, 1972, Ser. No. 318,561

Claims priority, application Italy, Dec. 28, 1971, 55062/71

Int. Cl. G03c *1/40*

U.S. Cl. 96—100 **3 Claims**

1. A silver halide photographic emulsion containing at least one two-equivalent benzoylacetanilide photographic coupler carrying on an aromatic ring thereof at least one ballasting group capable of imparting non-diffusing properties to said coupler, characterized by the fact that the coupler has a halogen atom in ortho position in the benzoyl residue, a chlorine or bromine atom as a substituent in the reactive methylene, and a hydrogen or halogen atom, or an alkyl, alkoxy, or dialkylamino group as substituent in the 2-position in the aniline residue, and a hydrogen atom or an acylamino, acyl, aryloxyacrylamino, arylaminosulfoxy or arylsulfonamido group as substituent in the 5-position in the aniline residue, the said 2-position and 5-position substituents together including alkyl groups having a total of at least 10 carbon atoms.

3,884,701

METHOD OF PREPARING SILVER HALIDE EMULSIONS

Alfons Jozef De Pauw, Edegem, and Jan Albert Carpentier, Walem, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed July 24, 1973, Ser. No. 382,115

Claims priority, application United Kingdom, Aug. 3, 1972, 36370/72

Int. Cl. G03c *1/02, 1/04*

U.S. Cl. 96—114.8 **8 Claims**

1. In a method of preparing a washed photographic silver halide emulsion in which an emulsion incorporating an acid-coagulable gelatin derivative is prepared and wherein the undesirable by-products of silver halide grain-formation and physical ripening are removed by lowering the pH to bring about coagulation and by washing the coagulum, the improvement which comprises effecting silver halide grain formation in an aqueous solution of both gelatin and an acid-coagulable gelatin derivative, the said derivative being present in a proportion sufficient to impart acid-coagulable properties to the entire mass, and effecting coagulation in the presence of a polystyrene sulfonic acid having a molecular weight of at most 30,000.

3,884,702

PHOTOSENSITIVE POLYAMIDE COMPOSITION

Akio Koshimo; Kosuke Tomita; KunihiKo Takagi; Minoru Mitsui, and Kunihiro Isikawa, all of Kyoto, Japan, assignors to Unitika, Ltd., Amagasaki-shi, Hyogo, Japan

Filed Dec. 14, 1972, Ser. No. 315,058
Int. Cl. G03c *1/68*
U.S. Cl. 96—115 P 21 Claims

1. A photosensitive polyamide composition comprising at least one non-photosensitive polyamide copolymer, having a molecular weight of from 2,000 to 40,000, containing 2 to 50 mol percent of a monomer having pendent sulfonate salt groups with the amount of sulfonate salt group-containing comonomer being sufficient to impart water solubility or dispersibility to the polyamide, at least one unsaturated compound having at least two polymerizable ethylenic double bonds and at least one photoinitiator.

3,884,703

BISAZIDE SENSITIZED PHOTORESISTOR COMPOSITION WITH DIACETONE ACRYLAMIDE

Yoichi Oba, Hachioji, and Teruo Tsunoda, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 11, 1973, Ser. No. 350,012
Claims priority, application Japan, Apr. 17, 1972, 47-37702
Int. Cl. G03c *1/52, 1/72*
U.S. Cl. 96—115 R 4 Claims

1. A photoresist composition comprising a water soluble organic resin selected from the group consisting of polyacrylamide, polyvinylpyrrolidone, gelatin, methylcellulose, a water soluble salt of poly-L-glutamate, a water soluble polyacrylate, a copolymer of vinyl alcohol and maleic acid, and a copolymer of vinyl alcohol and acrylamide, and a bisazide selected from the group consisting of sodium-4,4′-diazidestilbene-2,2′-disulfonate, sodium-4,4′-diazidestilbene-γ-carboxylate and sodium-4,4′-diazidebenzalacetophenone-2-sulfonate, as a photochemical reaction initiator, characterized in that diacetone acrylamide is added therein in an amount of at least 5 parts by weight based on 100 parts of said water soluble resin, whereby said photoresist composition is remarkably improved in adhesion for a substrate.

3,884,704

CATALYST SYSTEM FOR ACTIVATING SURFACES PRIOR TO ELECTROLESS DEPOSITION

Alan Rantell, London, England, and Abraham Holtzman, Bat-Yam, Israel, assignors to MacDermid Incorporated, Waterbury, Conn.

Filed Oct. 4, 1973, Ser. No. 403,503
Claims priority, application United Kingdom, Mar. 21, 1973, 13545/73
Int. Cl. C23c *3/02*
U.S. Cl. 106—1 6 Claims

1. A method for preparing a catalyst solution by heating a hydrochloric acid solution of a catalytic ion selected from the group consisting of Pd(II), Au(I), Au(III), Pt(II), Pt(IV), Rh(III), Ru(III), Ru(IV), Os(III), Os(IV), Ir(III), Ir(IV), Ag(I) with a solution containing a stochiometric excess of stannous salt wherein at least one of said solutions is first heated to a temperature in excess of 75°C before the other is added to it, and said elevated temperature is maintained during the progress of the reaction upon admixing the solutions, the concentration of the selected catalytic ion being equivalent to 6 to 30 mg/l of palladium metal in solution and said acid being present in the ratio of 400–500 milliliters of concentrated hydrochloric per liter of catalyst solution for each 30 milligrams of catalyst metal present in solution.

3,884,705

ANTI-CORROSION WELDABLE COATING COMPOSITIONS

Noel D. Blair, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Apr. 19, 1972, Ser. No. 245,384
Int. Cl. C09d
U.S. Cl. 106—1 10 Claims

1. In an anti-corrosion, weldable coating composition containing from about 3 to 80 percent by weight of a binder, and from about 20 to 97 percent by weight of a filler containing from about 60 to 99 percent by weight of said filler a comminuted refractory ferro alloy and from about 0 to 10 percent by weight of zinc dust, the improvement which comprises including as a component in said filler from about 1 to 40 percent of at least one non-metallic corrosion inhibitor selected from the group consisting of chromates, nitrites, phosphates, molybdates, tungstates, silicates and benzoates.

3,884,706

ALGICIDAL ROOFING GRANULES

David C. Little, Hagerstown, Md., assignor to GAF Corporation, New York, N.Y.

Filed Oct. 25, 1972, Ser. No. 300,854
Int. Cl. C04b *41/06*
U.S. Cl. 106—15 R 12 Claims

1. Algicidal roofing granules having an enhanced ability to inhibit or prevent the growth of discoloring algae and fungi organisms upon exposure of roofing surfaces containing such granules for extended periods of time, comprising base mineral granules coated with a moisture permeable, substantially water insoluble, durable, pigmented, fired, inorganic alkali metal silicate-clay coating containing zinc and copper algicides, said zinc algicide being present in an amount within the range of from about 0.05 to about 0.5 percent by weight based on the total weight of said granules, said copper algicide being present in an amount within the range of from about 0.05 to about 0.5 percent by weight based on the total weight of said base granules, said coating releasing zinc and copper ions slowly over an extended period of time during periods of rain and dew, whereby the zinc and copper ions released or leached during such periods of rain and dew produce a bimetallic toxic effect in retarding biological growth of algae and fungi, thus enhancing the resistance of roofing surfaces containing such granules to discoloration during extended periods of exposure to atmospheric weathering, particularly in humid environments conducive to the growth of such algae and fungi.

3,884,707

PRINTING INK AND PROCESS

Franklin A. Dick, Princeton; Donald W. Miller, Middletown, and Charles J. Miller, Hazlet, all of N.J., assignors to Beatrice Foods Co., Chicago, Ill.

Filed Nov. 9, 1973, Ser. No. 414,438
Int. Cl. C09d *11/04, 11/08*
U.S. Cl. 106—24 14 Claims

1. A printing ink consisting essentially of a solution having an alkalinity within the pH range of 7.0 to 11.5 containing 0.5 to 5% by weight basic dye, 8 to 65% by weight water miscible organic solvent selected from the group consisting of ethylene glycol, diethylene glycol, ethylene glycol ethyl ether, diethylene glycol ethyl ether, n-propyl alcohol and isopropyl alcohol and other water soluble alcohols of the type of n-propyl and isopropyl alcohol, 15 to 85% by weight water, 4 to 35% by weight resin soluble in said water-organic solvent combination selected from the group consisting of maleated rosin, fumerated rosin, phenolic modified rosin, acrylic resins, proteins, shellac, polyethylene oxide, carboxyl methyl cellulose, polyvinyl alcohol and reconstituted starch, and 0 to 6% pigment, the total weight percentage being 100% and the alkalinity, if any, being imparted to said composition by the addition of ammonia or a water soluble amine selected from the group consist-

ing of monoethanolamine, diethanolamine and diethylamine said ink being substantially free of laking agent.

3,884,708
THERMOPLASTIC PATTERN MATERIAL

Edward F. Burkert, Garfield Heights, Ohio, assignor to The Freeman Supply Company, Toledo, Ohio

Continuation-in-part of Ser. No. 238,966, March 28, 1972, abandoned. This application Oct. 9, 1973, Ser. No. 404,219
Int. Cl. B22 *7/00;* **C08f** *45/52*
U.S. Cl. 106—38.6 **12 Claims**

1. A filled heat liquefiable pattern material for use in making refractory molds and the like comprising the following materials in approximate percentages by weight: 5–60 percent of a material from the group consisting of mineral waxes, animal waxes, vegetable waxes and synthetic waxes; 10 to 60 percent of a hard thermoplastic resin plasticized by said wax and having a softening point between approximately 70°C and approximately 160°C; and 5 to 45 percent of a polyhydric alcohol of tetra substituted methane having no more than one substituted nonpolar alkyl carbon atom and having alcohol groups of up to and including six carbon atoms with an OH group on at least half of the carbon atoms of the alcohol groups.

3,884,709
POROUS MULLITE REFRACTORY

John Hay, Shrewsbury, Mass., assignor to Norton Company, Worcester, Mass.

Filed Dec. 17, 1973, Ser. No. 425,204
Int. Cl. C04b *35/10*
U.S. Cl. 106—65 **4 Claims**

1. A method of making porous monolithic shapes of bonded mullite grits comprising forming a mix of mullite grits and a manganese compound having a melting point below 1,450°, and which decomposes to manganese oxide between its melting point and 1,450°, forming said mix to shape and firing to produce a bond including manganese oxide adjacent the contacting portions of the mullite grits.

3,884,710
EXPANSIVE CEMENT

Joseph H. Allen, Irving; Waldemar A. Klemm, and John P. Luker, both of Dallas, all of Tex., assignors to General Portland, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 301,334, Oct. 27, 1972, abandoned. This application Oct. 10, 1973, Ser. No. 404,934
Int. Cl. C04b *7/04, 7/34*
U.S. Cl. 106—89 **28 Claims**

1. An expansive cement comprising a mixture of:
a. from about 99 to about 1% by weight of a hydratable cement; and
b. from about 1 to about 99% by weight of an expansive cement composition made from argillaceous and calcareous materials and containing from about 1 to about 30 weight % of free CaO, with the remaining portion being primarily tricalcium silicate and containing substantially no dicalcium silicate.

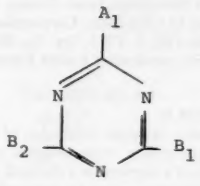
25. The method of claim **24** wherein said clinker is ground to yield particles which are no larger than about 20 mesh (Tyler) and have a fineness of no greater than about 6,000 cm^2/gm.

3,884,711
FLOOR CARE COMPOSITIONS CONTAINING TRIS-AMINO-S-TRIAZINES

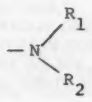
Denis Varsanyi, Arlesheim, and Willy Roth, Aargau, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 243,818, April 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 121,139, March 4, 1971, Pat. No. 3,752,811, which is a division of Ser. No. 672,701, Oct. 4, 1967, Pat. No. 3,594,374, which is a continuation-in-part of Ser. No. 560,855, June 27, 1966, abandoned. This application Mar. 27, 1974, Ser. No. 455,457
Claims priority, application Switzerland, June 30, 1965, 9158/65
Int. Cl.[2] C08H *9/06*
U.S. Cl. 106—271 **13 Claims**

1. A floor care composition comprising
a. a waxy component, from about 20 to 100 percent by weight of which calculated on the total weight of solids in the composition consists of a waxy triazine of the formulaa



wherein
A_1 is selected from the group consisting of



in which
R_1 represents alkyl of from 1 to 5 carbon atoms, and
R_2 represents alkyl of from 10 to 18 carbon atoms, pyrrolidino, piperidino, 4-methyl-piperazino, morpholino and hexamethyleneimino, and each of B_1 and B_2 is selected from the group consisting of pyrrolidino, piperidino, 4-methylpiperazino, morpholino and hexamethyleneimino,
b. a volatile organic solvent compatible with the floor to be treated with said composition and in sufficient amount to dissolve the solids content of the composition, and
c. from 0 percent to a sufficient amount of emulsifying agent for obtaining an aqueous emulsion of the mixture of the components (a) and (b), said floor-care composition being an organic solution or an aqueous emulsion capable, after evaporation of the solvent (b), of forming on a wooden floor a waxy, non-slippery coating having a gloss enhanceable by rubbing with a soft cloth, said coating being resistant to water and alkaline detergents.

3,884,712
PROCESS FOR PREPARING LIQUID POLYMERS

Tadahiro Go; Hiroshi Yaginuma, and Masaaki Inoue, all of Kawasaki, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed June 29, 1973, Ser. No. 375,102
Claims priority, application Japan, July 5, 1972, 47-67411
Int. Cl. C09d *3/48*
U.S. Cl. 106—285 **10 Claims**

1. A process for preparing a liquid polymer having an average molecular weight of 300–10,000 and an iodine number of at least 250 and being capable of forming hydrocarbon solvent-insoluble coatings, comprising copolymerizing a monomeric mixture containing 90–50% by weight of 1,3-pentadiene and 10–50% by weight of 1,3-butadiene in the presence of a homogenizable Friedel-Crafts type catalyst selected from the group consisting of boron trifluoride and complexes thereof, tin tetrachloride, ferric chloride, titanium tetrachloride, solubilized aluminum chloride, alkylaluminum dichloride, sulphuric acid and hydrogen fluoride.

3,884,713
PIGMENT DISPERSIONS

Robert Langley, Newton Mearns; George Heddle Robertson, Paisley, and Christopher James Bridge, Dalry, all of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

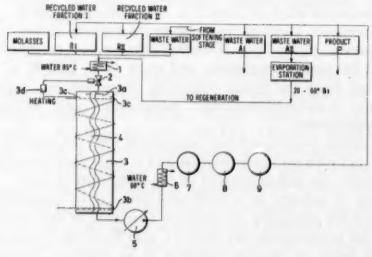
Filed Oct. 5, 1973, Ser. No. 403,740
Claims priority, application United Kingdom, Oct. 11, 1972, 46746/72
Int. Cl. C09c *3/02*
U.S. Cl. 106—308 N **10 Claims**

1. A flocculation-resistant dispersion of a solid in a liquid comprising a particulate solid material selected from the group consisting of a pigment or a dyestuff, an organic solvent suitable as a dispersion median for said particulate solid material and as a stabilizer a material which contains groups soluble in the organic solvent, which contains more than one urethane group and which contains no significant proportion of basic amino groups, wherein said stabilizer is within the range of from 5 to 200% by weight based on the particulate solid in the dispersion and said particulate solids is in the range of from 10 to 60% by weight based on the total weight of the dispersion.

3,884,714
PROCESS FOR MAKING SUGAR FROM MOLASSES BY ION REMOVAL

Hans-Georg Schneider, and Jiri Mikule, both of Euskirchen, Germany, assignors to Pfeiffer and Langen, Cologne, Germany

Filed July 9, 1973, Ser. No. 377,227
Int. Cl. C13d *3/14*
U.S. Cl. 127—46 B **13 Claims**



1. A process for extracting sugar from impure sugar bearing solution containing ionic impurities including alkaline earth ions comprising the steps of

passing said solution over an ion exclusion resin so that sugar is adsorbed by said resin and ionic impurities are excluded, then

passing a first sugar containing solution over said resin, then passing water over said resin,

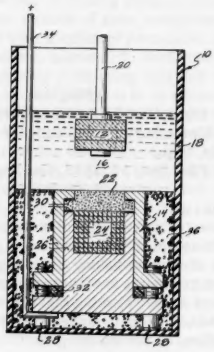
separately collecting the effluent from said resin in a plurality of separate fractions of different ionic impurity content concentrating at least a portion of the fraction of highest ionic content to provide a regeneration solution, and

regenerating said resin by passing said regeneration solution over said resin.

3,884,715
SECONDARY ELECTROCHEMICAL POWER-PRODUCING CELLS HAVING MIXED CATHODE COMPOSITION

Eddie C. Gay, Park Forest; Hiroshi Shimotake, Hinsdale, both of Ill.; Elton J. Cairns, Troy, Mich., and William J. Walsh, Naperville, Ill., assignors to The United States of America as represented by the Energy Research and Development Administration, Washington, D.C.

Continuation of Ser. No. 228,619, Feb. 23, 1972, abandoned.
This application Sept. 28, 1973, Ser. No. 401,729
Int. Cl. H01m *35/02, 43/00*
U.S. Cl. 136—6 F **2 Claims**



1. In a high-temperature, secondary electrochemical cell comprising an anode containing an alkali metal, an electrolyte containing ions of said metal and a cathode containing sulfur, the improvement wherein said cathode includes about 10 atom percent arsenic in a sulfur-arsenic mixture to inhibit loss of said sulfur from said cathode.

3,884,716
STORAGE BATTERY PLATE HAVING A CORE OF ALUMINUM AND A METHOD OF PREPARING THE SAME

Henry D. Walker, 4906 Bluebell Ave., North Hollywood, Calif.

Continuation of Ser. No. 313,835, Dec. 11, 1972, abandoned.
This application Mar. 11, 1974, Ser. No. 449,921
Int. Cl. H01m *35/00*
U.S. Cl. 136—26 **8 Claims**

1. A method of preparing a battery plate for a lead-acid storage battery comprising:

forming the core of said battery plate out of aluminum,

depositing a barrier coating over said core of one of the metals selected from the group consisting of zinc, nickel and chrome,

depositing a silver coating over said barrier coating, and

applying a lead coating over said silver coating.

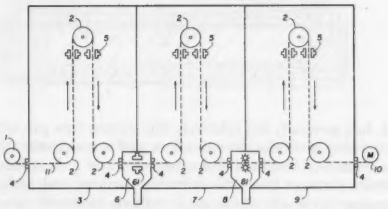
5. In a lead-acid battery wherein the battery plates are coated with lead, the improvement comprising:
an aluminum core for each said battery plate,
a coating of zinc over each said aluminum core, and
a coating of silver over each said zinc coating, on which said lead coating is deposited.

3,884,717

METHOD AND DEVICE FOR INTRODUCING ACTIVE MASS INTO POROUS ELECTRODE STRUCTURES FOR GALVANIC CELLS

Eckart Buder, Kelkheim, Taunus, and Wolfgang Knabenbauer, Hagen, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed Oct. 25, 1973, Ser. No. 409,600
Claims priority, application Germany, Oct. 28, 1972, 2253077; Apr. 11, 1973, 2318075
Int. Cl. H01m *35/18*
U.S. Cl. 136—67 **11 Claims**



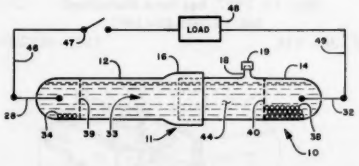
1. In a method of impregnating porous electrode structures of galvanic cells with active mass wherein the porous electrode structure is saturated with a metal salt solution from which, subsequently precipitated compounds of the metal remain in the electrode structure, the step of treating the electrode briefly with hot water after it has been saturated with the metal salt solution but before the metal compounds are precipitated.

3,884,718

RADIOACTIVE BATTERY

Ronald L. Deaton, Germantown, and Gary L. Silver, Centerville, both of Ohio, assignors to The United States of America as represented by the Energy Research and Development Administration, Washington, D.C.

Filed Apr. 19, 1973, Ser. No. 352,827
Int. Cl. H01m *29/00*
U.S. Cl. 136—83 R **6 Claims**



1. A radioactive battery comprising a housing, an electrolyte, said housing filled with said electrolyte, said electrolyte including radiation oxidizable material and radiation reducible material, catalytic material taken from the group consisting of platinum and platinized platinum disposed within said electrolyte, first and second electrodes spaced from each other each having one end immersed in said electrolyte and another end extending outside of said housing, said first and second electrodes of a material selected from the group consisting of platinum, gold, graphite, conductive ceramic and platinized platinum, a first portion of insoluble radioactive material selected from the group consisting of curium-244, thorium-229, thorium-230, actinium-227, plutonium-238, plutonium-239, and combinations thereof disposed in said electrolyte at from contacting to about one centimeter distance from said first electrode and restraining means for maintaining said first portion of said radioactive material at said first electrode.

3,884,719

BATTERY

Richard C. Evans; Murray A. Heine, both of Hamden, and Stanley J. Closek, East Haven, all of Conn., assignors to Olin Mathieson Chemical Corporation, New Haven, Conn.

Filed June 29, 1955, Ser. No. 518,718
Int. Cl. H01m *21/14*
U.S. Cl. 136—90 **9 Claims**

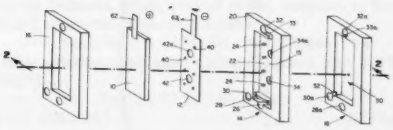
1. An electrode for a heat activated cell of the stacked disc type comprising a nickel metallic folder of circular planar section having a narrow joining fold portion between its leaves which enclose a layer of electrolyte fusible heat producing composition, the outer face of one of said leaves being coated with calcium.

3,884,720

MULTICELL SEAWATER BATTERY

John Armstrong, Winnipeg, Manitoba, Canada, assignor to ESB Incorporated, Philadelphia, Pa.

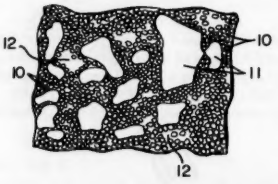
Continuation-in-part of Ser. No. 323,932, Jan. 15, 1973, abandoned. This application Apr. 9, 1973, Ser. No. 349,291
Int. Cl. H01m *17/00*
U.S. Cl. 136—100 R **9 Claims**



1. A multicell seawater battery wherein a series of cells each having a metal halide cathode, a metal anode arranged in face to face orientation and an electrolyte space therebetween which comprises:
a. at least one top duct located at the top of the battery each duct connected by at least one port to the electrolyte space of each cell;

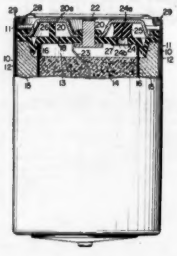
b. at least one first bottom duct located at the bottom of the battery each duct connected by at least one port to the electrolyte space of each cell;
c. a reservoir located adjacent each metal anode and at least one port leading from each such reservoir to each top duct;
d. at least one second bottom duct located at the bottom of the battery and connected by at least one port to the reservoir of each cell; and
e. at least one opening formed through the anode of each cell connecting the reservoir of each cell to the electrolyte space of each cell.

3,884,721
ANODE FOR GALVANIC CELLS
Gary Ronald Tucholski, Parma, Ohio, assignor to Union Carbide Corporation, New York, N.Y.
Filed Mar. 18, 1974, Ser. No. 452,121
Int. Cl. H01m *13/00*
U.S. Cl. 136—102 **13 Claims**



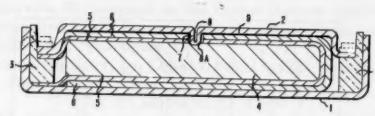
1. An improved composite anode for use in an alkaline galvanic cell comprising in combination, zinc particles, an alkaline electrolyte and a cross-linked polyacrylamide, wherein said alkaline electrolyte is absorbed in said cross-linked polyacrylamide to form electrolyte nuggets and wherein said zinc particles are wetted with electrolyte and are distributed throughout said composite anode in a manner such that said zinc particles are in contacting relation with said electrolyte nuggets and with each other.

3,884,722
ALKALINE GALVANIC CELLS
Gary Ronald Tucholski, Parma, Ohio, assignor to Union Carbide Corporation, New York, N.Y.
Filed Mar. 18, 1974, Ser. No. 452,131
Int. Cl. H01m *17/00*
U.S. Cl. 136—102 **29 Claims**



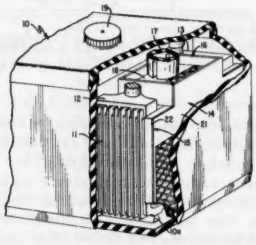
1. An improved alkaline galvanic cell which comprises, in combination a cell container, an anode chamber and a cell closure for said cell container, venting means including a venting orifice in said closure defining a conduit for the passage of gas from said anode chamber, said venting orifice having a top portion and a bottom portion, a pressure movable resealable venting valve member biased into sealing position on the top portion of said orifice and gas-permeable, liquid-impermeable membrane disposed on the bottom portion of said venting orifice, said anode chamber including a composite anode containing zinc particles, an alkaline electrolyte and cross-linked polyacrylamide, wherein said alkaline electrolyte is absorbed in said cross-linked polyacrylamide to form electrolyte nuggets and wherein said zinc particles are wetted with electrolyte and are distributed throughout said composite anode in a manner such that said zinc particles are in contacting relation with said electrolyte nuggets and with each other.

3,884,723
BUTTON TYPE GALVANIC CELL
Klaus Guenther Wuttke, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.
Filed Oct. 12, 1973, Ser. No. 405,806
Int. Cl. H01m *1/02*
U.S. Cl. 136—111 **8 Claims**



1. In a generally flat relatively thin button type galvanic cell comprising a conductive container and a conductive top for the container insulated from the container and at least one contact element from the container or top, and within the container an anode electrode, a cathode electrode, a separator between the electrodes, and an electrolyte, the improvement comprising
a first electrode having two flat sides encased on both sides by a porous nonconductive separator and by a second electrode, the second electrode and the separator each containing at least one aperture in the same relative location through which contact is made between the encased electrode and either the container or top by means of said contact element, said contact element being a protuberance from the container or top, there being no contact between the protuberance and the electrode through which the protuberance passes.

3,884,724
METHOD OF ACTIVATING STORAGE BATTERIES
John P. Badger, Genoa, and Herbert A. Bernholtz, Sylvania, both of Ohio, assignors to Eltra Corporation, Toledo, Ohio
Continuation-in-part of Ser. No. 733,135, May 29, 1968, Pat. No. 3,540,939. This application Nov. 12, 1970, Ser. No. 88,813The portion of the term of this patent subsequent to Nov. 17, 1987, has been disclaimed.
Int. Cl. H01m *45/00*
U.S. Cl. 136—114 **2 Claims**



1. A method of activating a storage battery of the water-activable type in which concentrated battery acid is retained

within each cell in liquid form in a body of liquid absorbent material at a level below saturation in an area remote from the plates in said cell comprising the steps of adding water directly to said body of adsorbent material, retaining said added water in said absorbent body while percolating therethrough, and subsequently releasing the combined water and acid as battery electrolyte to the plates within said cell.

3,884,725

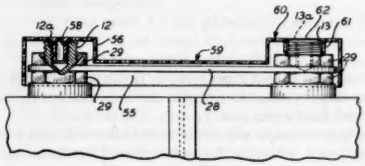
BATTERY WITH POST-STRAP INSULATIVE CAP

Jacob E. Schmidt, Little Falls, N.J., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Feb. 15, 1974, Ser. No. 443,020

Int. Cl. H01m 1/02

U.S. Cl. 136—134 R **5 Claims**



1. A battery comprising a plurality of individual cells having cases permitting the cells to be set side-by-side in rows and having upright terminal posts of positive and negative polarity, each with threaded end portions, said cells being arranged with the terminal post of one polarity of one cell adjacent to a terminal post of the opposite polarity of the next cell, post connectors between successive cells each comprising upper portions of a pair of said adjacent posts and a metal strap having apertured end portions fitted on said upper portions, nuts threaded on said posts to secure said straps thereto, and an insulative cap for each of said post connectors having a channel-shaped central portion covering said metal strap and having hollow end portions covering the respective terminal posts connected to said strap, each of said hollow end portions of each of said caps having internal elements releasably engaging the respective terminal posts to hold the cap in place over a post connector in response to pressing the cap thereon.

3,884,726

THERMOELECTRIC ELEMENT

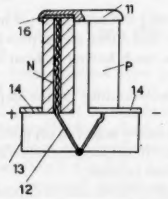
Kurt Landecker, 157 Marsh St., Armidale, New South Wales, Australia

Filed Apr. 19, 1973, Ser. No. 352,843

Claims priority, application Australia, May 11, 1972, 8924/72

Int. Cl. H01v 1/02

U.S. Cl. 136—203 **17 Claims**



1. A thermoelectric element comprising an N conductor and a P conductor connected together at a working junction and adapted to be connected to an external current source or an electrical load by means creating a non-working junction, at least one shunting conductor providing a leakage current flow-path between the N and P conductors in parallel with the working junction, and means to maintain said shunting conductor at a potential intermediate the potentials of those ends of the N and P conductors having disparate potentials.

3,884,727

METHOD OF COATING WIRE SCREEN CLOTH

Louis John Jacobs, Chicago, Ill., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 21, 1972, Ser. No. 317,335

Int. Cl. C23c 1/10

U.S. Cl. 148—6.2 **4 Claims**

1. A method of treating wire screen cloth so as to form a coating thereon containing chromic oxide and to bond the wires together at the points of intersection comprising the steps of:

a. providing a wire screen cloth, the wires of said wire screen cloth having a thin porous oxide layer thereon;

b. coating said wire screen cloth with a chromic acid solution; and

c. heating said wire screen cloth to a temperature sufficient to convert said chromic acid solution to chromic oxide and to heat treat said wire whereby a coating of chromic oxide is formed on said wires and said wires at the points of intersection are bonded together with chromic oxide.

3,884,728

THERMO-MECHANICAL TREATMENT OF ZIRCONIUM ALLOYS

Ira S. Levy, Kennewick, Wash., assignor to Exxon Nuclear Company Inc., Bellevue, Wash.

Filed Feb. 26, 1973, Ser. No. 335,679

Int. Cl. C22f 1/18

U.S. Cl. 148—11.5 F **18 Claims**

1. A method of treating a metal comprising at least 95 percent zirconium and also comprising at least one constituent selected from the class consisting of chromium, tin, niobium, iron, tantalum, nickel and aluminum, which metal is in a thoroughly annealed condition, said method comprising subjecting said metal to a tensile creep strain of 3 to 10 percent while holding it in a temperature range in which creep will occur, yet which is below the temperature for significant recovery, said tensile creep strain being attained by tensile loading said metal at a strain rate of about 0.001 to 0.01 inch/inch/minute until said strain is attained, followed by holding said metal at the final load for at least 15 minutes.

3,884,729

METHOD OF PROVIDING AN ALUMINUM COATING ON A STEEL SUBSTRATE

Albert Edward Jackson, Gwernaffield Mold, and Ernest Wynne Williams, Mold, both of Wales, assignors to British Steel Corporation, London, England

Filed Nov. 1, 1973, Ser. No. 411,846

Claims priority, application United Kingdom, Nov. 3, 1972, 50773/72

Int. Cl. C21d ; B22f 7/00

U.S. Cl. 148—11.5 A **13 Claims**

1. In a method of providing a surface of a steel substrate with an aluminium coating, the said method comprising electroplating the said surface of the steel substrate with a layer of iron, coating the iron layer with a layer containing aluminium powder, and compacting the said iron and powder layers to the substrate, the improvement which consists of subsequently effecting a cold reduction which reduces the gauge of the so-called substrate by at least 30 percent, and effecting a subsequent recrystallisation annealing heat treatment to make the iron and powder layers adhere tightly to the substrate.

3,884,730
MACHINE ELEMENT OF SURFACE-HARDENED STEEL HAVING AN IMPROVED RESISTANCE AGAINST WEAR, HEAT, AND MECHANICAL STRESS

Karl Hehl, Siedlung 183, 7291 Lossburg, Wurttemberg, Germany

Filed July 5, 1973, Ser. No. 376,292
Claims priority, application Germany, July 5, 1972, 2232932
Int. Cl. C21d *1/42, 9/00*
U.S. Cl. 148—12.4 **8 Claims**

5. A method of producing a plastification feed screw for the processing of abrasive plastic raw materials in an injection molding machine, or the like, comprising the steps of:

machining the feed screw from a piece of tool steel alloy containing no less than 1.5 percent carbon and no less than 3.5 percent carbide and super carbide forming alloy components;

heating the feed screw surface in an induction field, by moving it in relation to a surrounding induction coil whose frequency is comprised between 0.5 and 20 kHz, in at least two successive passes, thereby progressively heating the feed screw to a temperature above the transformation point Ac_3, over a depth of at least 2 mm; and thereafter

quenching the heated feed screw, by passing it through a quenching means surrounding the feed screw.

3,884,731
METAL COMPOSITE AND METHOD OF PRODUCING THE SAME

Erik F. Barkman, Henrico; John Harry Jackson, Richmond, and Bennie Ray Ward, Jr., Chesterfield, all of Va., assignors to Reynolds Metals Company, Richmond, Va.

Division of Ser. Nos. 380,064, July 2, 1964, abandoned, and Ser. No. 656,946, July 28, 1967, abandoned. This application Oct. 24, 1968, Ser. No. 798,513
Int. Cl. C22c *41/02;* **C21c** *1/00*
U.S. Cl. 148—127 **9 Claims**

1. In the art of producing a metal composite having a layer of stainless steel and a layer of aluminous metal, the latter being a heat-treatable aluminum base alloy of the type adapted for solution heat treatment in the range of about 850°–950°F., the improvement comprising:

providing a bonded composite of the aluminum alloy and a member of the class of semi-austenitic precipitation hardenable stainless steels which are susceptible to aging treatment at a temperature in said range of about 850°–950°F. effective to strengthen the steel;

heating the bonded composite in said temperature range for a period sufficient to effect solution treatment of the aluminum alloy component, thereby concurrently age hardening the stainless steel component; and

quenching the composite at a cooling rate sufficient to retain the aluminum alloy's soluble constituents in solid solution.

3,884,732
MONOLITHIC STORAGE ARRAY AND METHOD OF MAKING

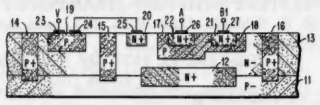
Utz G. Baitinger, Stuttgart, and Knut K. Najmann, Gartringen, both of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 267,324, June 29, 1972, Pat. No. 3,810,123. This application Sept. 17, 1973, Ser. No. 398,040
Claims priority, application Germany, July 29, 1971, 2137976
Int. Cl. H01l *7/44, 29/72, 7/64*
U.S. Cl. 148—175 **1 Claim**

1. In the planar process for fabricating multi-emitter transistor devices in integrated form in which a subcollector is diffused into a semiconductor substrate and an epitaxial layer is grown on said substrate and diffused subcollector, the improvement comprising the steps of:

diffusing a first base zone of predetermined width into the epitaxial layer over the subcollector,

diffusing a second base zone into the first zone and into the epitaxial layer laterally adjacent to said first zone so that



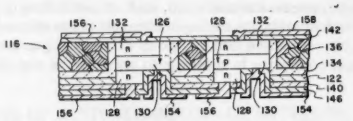
said second zone merges into the first zone, said first base zone thereby extending nearer said subcollector than said second base zone, and

diffusing simultaneously emitters into the first and second base zones, whereby the width of said first base zone is greater than the width of said second base zone.

3,884,733
DIELECTRIC ISOLATION PROCESS

Kenneth Elwood Bean, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 171,665, Aug. 13, 1971, abandoned. This application Feb. 19, 1974, Ser. No. 443,290
Int. Cl. H01l *7/36, 27/04*
U.S. Cl. 148—175 **7 Claims**



1. A method for the manufacture of dielectrically isolated semiconductor devices comprising:

a. planarizing a monocrystalline semiconductor substrate to provide a surface parallel to a selected crystallographic plane;

b. epitaxially depositing a semiconductor material at predetermined sites on said substrate to provide a plurality of deposited regions, each having at least one p-n junction therein;

c. forming a dielectric coating on the deposited semiconductor material;

d. depositing a reinforcing material on the dielectric coating to a depth sufficient to substantially fill the spaces between the deposited regions;

e. removing the original substrate to expose surfaces of the epitaxial structures;

f. then planarizing the reinforced surface of the structure to reexpose the opposite surfaces of the epitaxial structures; and

g. then selectively metallizing both surfaces of the composite structure to establish ohmic contact to selected portions of both surfaces of said epitaxial structures.

3,884,734
PHOSPHORUS-CONTAINING COMPOSITIONS

Malcolm George Palmer, Blakedown, and Anthony Donald Ball, Coseley, both of England, assignors to Albright & Wilson Limited, Oldbury, England

Filed May 3, 1973, Ser. No. 356,888
Claims priority, application United Kingdom, May 5, 1972, 21061/72
Int. Cl. C06b *19/02*
U.S. Cl. 149—6 **13 Claims**

1. A solid combustion composition consisting essentially of (i) powdered red phosphorus particles coated with from 0.5 to 10percent by weight on the phosphorus of a liquid unsaturated organic compound selected from the group consisting of vinyl hydrocarbons, hydrocarbon substituted ethylenes, unsaturated carboxylic acids and esters of unsaturated carboxylic acids or with a polymeric resin formed by autoxidation of said liquid organic compound;

ii. an oxidising agent for the phosphorus selected from the group consisting of metal carbonates, alkali metal sulphates and alkaline earth metal sulphates in a proportion of from 0.5 : 1 to 1.5 : 1 by weight on the phosphorus; and

iii. a substance which will decompose during combustion of the phosphorus to give an inert gas, which substance is selected from the group consisting of oxalic acid and urea and is present in a proportion of from 0.5 to 10 percent by weight on the composition.

3,884,735
EXPLOSIVE COMPOSITION

Charles H. Cramer, Woodbury, N.J., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed July 19, 1956, Ser. No. 598,734
Int. Cl. C06b *19/02*
U.S. Cl. 149—11 **5 Claims**

1. An explosive composition consisting of pellets of a crystalline high-explosive compound selected from the group consisting of pentaerythritol tetranitrate, cyclotrimethylenetrinitramine, cyclotetramethylenetetranitramine, tetranitromethylaniline, and trinitrotoluene, said explosive compound being coated with an epoxy hydroxy polyether nonreactive with the high-explosive compound and which is at least partially cured by means of a curing agent nonreactive with the high-explosive compound, said epoxy hydroxy polyether being present in the amount of 3–15 percent by weight of the mixture of high-explosive compound and epoxy hydroxy polyether.

3,884,736
DOUBLE-BASE PROPELLANT CONTAINING AN AROMATIC HYDROXY COMPOUND

Joseph S. Stack, Riverdale, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 6, 1967, Ser. No. 630,490
Int. Cl. C06b *5/00*
U.S. Cl. 149—100 **16 Claims**

1. In a double base plastisol type propellant containing nitrocellulose and liquid nitrate esters in combination with between 0.5 and 2.0 percent by weight of either 2,4-tolylene diisocyanate or hexamethylene diisocyanate based on the weight of said propellant, the improvement consisting in the incorporation of between 0.5 and 2.0 percent by weight of an aromatic hydroxy compound based on the weight of said diisocyanate, thereby rendering said propellant homogeneous and void-free, said aromatic hydroxy compound selected from the group consisting of

1,3-dihydroxy benzene,
1,2-dihydroxy benzene,
1-methyl-3,5-dihydroxy benzene,
1,4-dihydroxy benzene,
1,2,3-trihydroxy benzene,
1,3,5-trihydroxy benzene,
1,3-dihydroxy-2-nitro-benzene,
1-hydroxy-3-aceto-benzene,
1-3-dihydroxy-2-methyl benzene,
1-methanol-2-hydroxy benzene, and
1,3-dihydroxy-2,4-nitroso-benzene.

3,884,737
METHOD OF FORMING A DECORATIVE PANEL AND WALL

Ernest O. Bransford, Jr., Greensboro, N.C., assignor to Beaman Corporation, Greensboro, N.C.

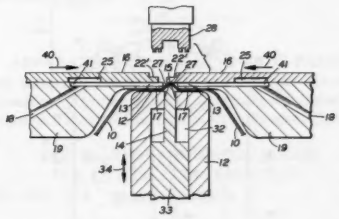
Filed Apr. 16, 1973, Ser. No. 351,148
Int. Cl. B44c *3/12*
U.S. Cl. 156—63 **5 Claims**

1. A method of forming a panel simulating a true masonry wall comprising the steps of; providing an uncured, resin mixture substrate over a selected area of a support, arranging a plurality of bricks in a selected pattern upon said uncured, resin substrate, applying granular material chosen from the group consisting of (a) sand, (b) rock dust, (c) marble dust over the exposed, portions of the ungelled resin mixture between adjacent bricks, and bonding the bricks and at least a portion of the granular material to the resin during curing of the resin by capillary action of the ungelled resin mixture which arises through the granular material and partially encompasses the edges of the bricks.

3,884,738
METHOD AND APPARATUS FOR FASTENING SLIDE FASTENERS TO AN ARTICLE

David V. Hofius, Sr., 235 Pierce Ave., Sharpsville, Pa. 16150

Filed Apr. 8, 1974, Ser. No. 458,681
Int. Cl. B32b *31/20*
U.S. Cl. 156—73.1 **14 Claims**



2. A method of attaching a zipper to another material by ultrasonic welding comprising

a. loading the material to which the zipper is to be joined onto a movable clamping anvil,
b. clamping the material against two spaced vacuum plates,
c. die cutting a slit in the clamped material against said sliding plates,
d. moving said sliding plates apart,
e. pushing the edges of said material adjacent said slit between said vacuum plates by punch overtravel,
f. applying a vacuum to the cut edges of said material to turn the edges of said material 180° back over on said vacuum plates,
g. moving the upper slide plate laterally thereby opening up slots in the top side of the plate,
h. loading a zipper in said machine,
i. welding the zipper to the edges ultrasonically.

3. An apparatus for ultrasonically welding a zipper to a sheet of material comprising

two spaced vacuum plates defining a slot,

laterally extending slots in the top surface of said vacuum plates extending from adjacent the ends thereof,

two sliding plates, one said sliding plate slidable laterally on top of each of said vacuum plates from a position where the ends of said sliding plates are adjacent each other to a position spaced further from each other,

means for connecting said slots in said vacuum plates to a vacuum channel,

a source of vacuum connected to said vacuum channel,

a punch,

an anvil below said vacuum plates adapted to clamp said sheet material to said vacuum plates,

said punch being slidably received in said anvil,

and means connected to said punch to move said punch into engagement with a said sliding plate when said plate is slid over said top of said punch whereby a slit may be cut in said sheet material,

means on said vacuum plates to receive the edges of said cut material with a zipper on top thereof,

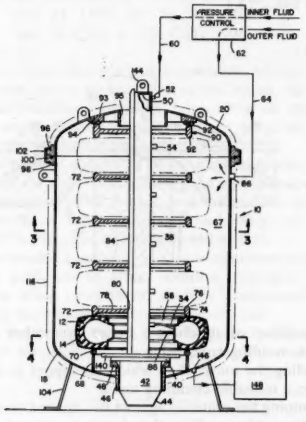
and an ultrasonic head above said anvil adapted to move down into engagement with said zipper, clamping said zipper in engagement with said anvil, and means connected to said ultrasonic head for ultrasonically welding said zipper to said material.

3,884,739

APPARATUS FOR SIMULTANEOUSLY RECAPPING A PLURALITY OF TIRES WITH PRECURED TREAD RUBBER

Herbert B. Hindin, Alamo; Alfred E. Johnson, El Cerrito, and Donald P. Knapp, San Francisco, all of Calif., assignors to Oliver Tire & Rubber Company, Oakland, Calif.

Filed Sept. 13, 1973, Ser. No. 397,014
Int. Cl. B29h *5/04, 17/36*
U.S. Cl. 156—96 **21 Claims**



1. Apparatus for simultaneously recapping a plurality of tires arranged as axially aligned tire assemblies, each said assembly including a tire casing, a strip of precured tread rubber about the casing, a rim device contacting the beads of the tire and a flexible envelope covering the precured tread rubber with means for venting air from under the envelope, said apparatus comprising:

a tubular body member with a fixed end wall forming a cavity and adapted to surround the axially aligned tire assemblies;

a removable end cover member forming a fluid tight connection with one end of said body member;

a first annular end sealing member supported by and extending axially from the inner surface of said end wall to engage the envelope of the lowermost tire assembly of said plurality of tire assemblies;

a second annular end sealing means for engaging the envelope of the uppermost tire assembly of said plurality of tire assemblies and for forming a fluid tight seal between it and the inner surface of said end cover member;

annular intermediate sealing members located between pairs of adjacent tire assemblies and bearing against their respective envelopes;

a fluid pressure manifold means extending axially through said tubular body member and said end cover means;

retaining means attached to said manifold means near one end thereof and adapted to support a plurality of stacked tire assemblies so that they can be installed on said retaining means outside of said body member;

centering means attached to and extending axially from said manifold means below said retaining means;

guide means in said fixed end wall for removably receiving said centering means for thereby holding the stacked tire assemblies on said manifold means in substantially axial alignment within said tubular body member;

connector means spaced apart along said manifold means adapted to be coupled to each tire assembly for maintaining a predetermined internal pressure within each said tire; and

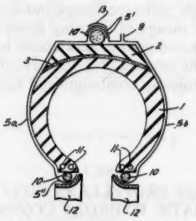
means for maintaining said end cover member locked to said body member while maintaining internal pressure within the tires to cause said sealing members to assume a fluid tight sealing engagement with said envelopes, thereby forming a sealed toroidal chamber around said tire assemblies for retaining fluid pressure at a level slightly less than said internal pressure.

3,884,740

METHOD OF RETREADING TIRES

Wilhelm Schelkmann, Crengeldanzstr 85a, D.581 Witten, Germany

Filed Sept. 20, 1973, Ser. No. 399,060
Int. Cl. B29h *5/04;* **B60c** *11/00, 21/00*
U.S. Cl. 156—96 **6 Claims**



1. In a method of retreading tires, the steps of forming an assembly from a tire carcass having a U-shaped cross-section, a profiled tread strip on the peripheral surface of said carcass, and a layer of binder material sandwiched between said surface and said tread strip; stretching an elastic annular cord onto the radially outermost peripheral portion of the profiled tread strip so that it presses radially inwardly against the profiled tread strip; surrounding the thusly formed assembly over the entire circumference of said carcass with a flexible annular envelope not permanently connected to said annular cord and comprised of a first and a second marginal portion defining together with said assembly at least one gap communicating with the interior of the envelope; and sealing said gap by stretching said first marginal portion over said annular cord to such an extent that said first marginal portion stays in place stretched over said annular elastic cord by virtue of the tension in the thusly stretched first marginal portion, and then stretching said second marginal portion over said annular cord and over said first marginal portion to such an extent that said

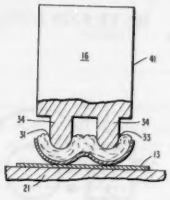
second marginal portion afterwards stays in place stretched over said annular elastic cord and over said first marginal portion by virtue of the tension in the thusly stretched second marginal portion.

3,884,741

METHOD AND APPARATUS FOR THE MANUFACTURE OF FILTER RODS CONTAINING PARTICULATE MATERIAL BY A SPLIT ROD TECHNIQUE

John H. Sexstone, Middletown, Ky., assignor to Brown & Williamson Tobacco Corp., Louisville, Ky.

Filed Feb. 22, 1974, Ser. No. 445,311
Int. Cl. A24b *15/02;* **A24d** *1/06*
U.S. Cl. 156—259 **9 Claims**



1. A method of manufacturing tobacco smoke filters comprising the steps of:

a. providing a preformed filter rod of filtering material having a longitudinal axis,

b. cutting said rod in the direction of said axis,

c. spreading apart the cut rod to expose the interior of said rod,

d. providing pockets at axially spaced positions in the interior of said rod prior to depositing particulate material,

e. depositing particulate material in said pockets,

f. closing the rod about said particulate material, and

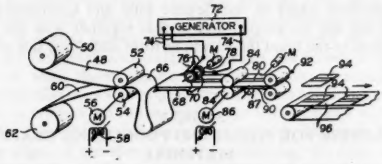
g. sealing the rod.

3,884,742

METHOD OF MAKING PLASTIC BOOK COVER

Alvin V. Roberts, Scarsdale, N.Y., assignor to Bookwrights, Inc., Scarsdale, N.Y.

Filed Mar. 21, 1973, Ser. No. 343,017
Int. Cl. B32b *31/20*
U.S. Cl. 156—268 **14 Claims**



1. The method of making a plastic book cover, which method includes feeding into a zone between electrodes a plastic laminate comprising a first component layer of plastic, of a stiffness suitable for front and back panels of a cover for a book and that has the further characteristic of becoming highly heated and flowable locally between said electrodes when the electrodes are used to produce a high frequency dielectric field at said zone, said first layer being bonded to a second component layer of plastic having substantially more flexibility than the first layer and suitable for hinges of the cover and having the further characteristic that substantially less heat is generated in it by the same high frequency dielectric field that heats the first layer, heating the first component of the laminate, between said electrodes by the high frequency dielectric field, to a flowable condition, exerting pressure by one of the electrodes against the flowable material of the first component with sufficient pressure to displace permanently the flowable material to produce a groove in the first component while the second component has less heat generated therein by said dielectric field and remains below flowable temperature, and displacing said material of the first component along a hinge line of the cover made from the laminate.

3,884,743

PROCESS FOR PRODUCING DECORATIVE PILE FABRICS

Anthony F. Kunak, and Andrew Falatok, both of Spartanburg, S.C., assignors to Atteny, Inc., Spartanburg, S.C.

Filed Oct. 16, 1972, Ser. No. 297,773
Int. Cl. B29c *19/00*
U.S. Cl. 156—304 **4 Claims**

1. A method for producing a multicolored decorative pile fabric comprising:

a. cutting a plurality of selectively shaped pile fabric sections such that the fiber grain of all sections will be in alignment when the sections are joined, said sections having substantially the same pile height and density and at least one different color, said cutting being accomplished by bringing a cutting edge into contact with said pile fabric and removing any pile fibers from under said cutting edge prior to making the cut;

b. assembling said sections on a backing material in substantially abutting relationship according to a predetermined pattern while removing any pile fibers that extend into joints between the sections, said backing material having a thermoplastic adhesive thereon;

c. heating the assembly to a temperature not greater than approximately 375°F. for a time sufficient to activate the adhesive;

d. applying pressure along the edges of the sections adjacent the joints to insure a good bond and preclude curling of said edges; and

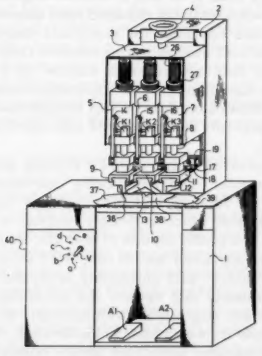
e. permitting the composite to cool to securely bond the sections together.

3,884,744

APPARATUS FOR WELDING SHOE PARTS

Jaromir Ranocha; Dusan Repka, and Bohumil Machu, all of Gottwaldov, Czechoslovakia, assignors to Zavody elektrotepelnych zarizchi, hardoni podnik, Prague, Czechoslovakia

Filed May 31, 1973, Ser. No. 365,448
Int. Cl. B29c *27/04;* **B30b** *15/34*
U.S. Cl. 156—351 **5 Claims**



1. Apparatus for the high frequency welding of articles such as shoe parts and the like comprising a table for receiving said

shoe parts, a frame extending above said table, a plurality of pressure cylinders arranged on said frame having piston rods extending downwardly therefrom, means for actuating said cylinders to extend said rods toward said table, means for removably mounting to the ends of selected ones of said piston rods either an electrode or a clamp, a terminal board mounted on said frame and connected to a source of current, first contacts adapted to be mounted on respective ones of said piston rods and extend therefrom toward said terminal board, second contacts adapted to be mounted on said terminal board, each of said second contacts being adapted to extend from said terminal board in association with a selected one of said first contacts, at least one of each of said associated first and second contacts being removably mounted respectively to said piston rod and terminal board so as to permit engagement of said contacts in association with selected ones of said piston rods, said terminal board being arranged on said frame so that the first and second contacts engage at the bottommost dead center position of said piston rods.

3,884,745

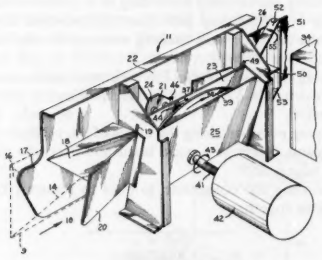
ENVELOPE MOISTENING AND SEALING APPARATUS

Paul R. Sette, Hamden, Conn., and Anthony Storace, Tarrytown, N.Y., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Mar. 20, 1974, Ser. No. 452,676

Int. Cl. B43m *5/04*; **B65c** *11/04*

U.S. Cl. 156—441.5 **1 Claim**



1. Apparatus for replenishing moisture dispensed by a fluid moistening applicator to a flap of an envelope, said apparatus comprising:

a reservoir for supplying a quantity of moistening fluid;

a trough-like container connected to said reservoir for receiving said moistening fluid therefrom, and for dispensing said fluid to said envelope flap, said container having a fluid level and a window disposed above said fluid level, a rotatably mounted plate disposed within said trough-like container for movement through said fluid and past said window during rotation thereof, said plate carrying fluid towards said window as it rotates, said window has a flap restriction spanning across said window which allows a brush to project through said window, but which prevents the flap of said envelope from projecting therein;

means connected to said plate for rotating said plate within the container, said plate being disc-shaped, and said means for rotating said plate being a motor having a rotative shaft which is flexibly coupled to a shaft connected to a center section of said disc-shaped plate;

moistening applicator means supported adjacent said container window, said moistening applicator means being biased towards said window and projecting through said window into engagement with said plate to absorb moistening fluid from said plate in the absence of an envelope, said moistening applicator means comprising a brush which is articulatively mounted opposite said window, and a spring acting upon said brush to bias the brush towards said window; and

means for transporting a flap of an envelope between said moistening applicator means and said window, whereby the flap of said envelope causes the moistening applicator means to separate from its engagement with said plate, and engage with said flap, thereby applying moistening fluid to said flap from said moistening applicator means.

3,884,746

WELDING APPARATUS FOR A PACKAGING MACHINE

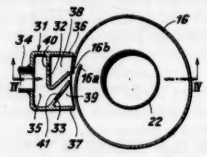
Willi Löliger, and Rudolf Schmied, both of Konolfingen, Switzerland, assignors to Alpura Koreco A.G., Konolfingen, Switzerland

Filed July 7, 1972, Ser. No. 269,523

Claims priority, application Switzerland, July 9, 1971, 10095/71

Int. Cl. B32b *31/20*

U.S. Cl. 156—466 **2 Claims**



1. Welding apparatus for a packaging machine in which the longitudinal edges of a moving web of packaging material are welded for creating a flexible tube from which the finished packages are formed, in which hot air can be led into the gap between the longitudinal edges of the packaging material pre-formed into a flexible tube apd provided with pressure-applying means for welding together the portions of the web extending along the longitudinal edges and heated by the hot air, characterized by a hood to bring up the hot air having an opening surrounded by wall portions and directed on to the portions of each edge of the flexible tube to be welded and whose wall portions are shaped in such a way that the opening is located in the immediate area of the external surface of the pre-formed flexible tube and with the opening in the hood extending at least over the side edges of the web to be welded in the peripheral direction of the flexible tube, said hood being subdivided by means of partitions extending in the direction of travel of the flexible tube, which partitions forms a chamber opening in nozzle-like manner towards the gap between the longitudinal edges of the flexible tube and communicating with the hot air supply, and in that together with the wall portions of the hood the partitions form additional side chambers.

3,884,747

MACHINE FOR SIZING AND PROCESSING DRAPERY MATERIAL

Enrique Soto, 514 Orange Grove Ave., South Pasadena, Calif. 91030

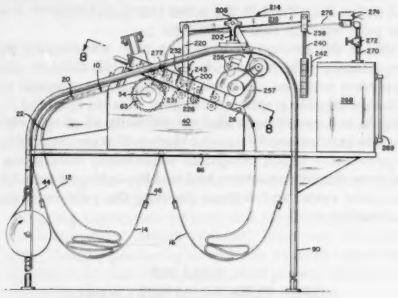
Continuation-in-part of Ser. No. 841,246, July 14, 1969, abandoned, and a continuation-in-part of Ser. No. 155,022, June 21, 1971, Pat. No. 3,795,565. This application Aug. 22, 1973, Ser. No. 390,332

Int. Cl. B29d *31/00*

U.S. Cl. 156—467 **10 Claims**

1. A machine for tabling and sizing fabric material comprising: means providing a tabling surface, on which the material is tumbled from one side to the opposite side of the surface means; said surface means having a gap with an elongated cylindrical driven roller means having a part of its surface in the gap; means adjacent one end of the roller means for applying a flat stiffener strip on the edge part of the material, and means overlying the surface means and extending along the

surface means transversely to the direction of movement for guiding and holding the fabric material while transversing the surface means, said overlying means including means for



holding down the fabric and for accurately positioning and guiding the opposite edge part of the material whereby to accurately establish an overall dimension of finished fabric material processed by the machine.

3,884,748

PROCESS AND DEVICE FOR THE STRETCHING OF PLASTICS SHEETS

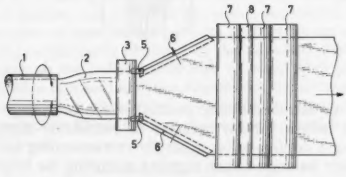
Heinz-Erhardt Andersen, Burgkirchen/Alz, and Georg Stangl, Ehring, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 21, 1972, Ser. No. 308,564

Claims priority, application Germany, Nov. 24, 1971, 2158141

Int. Cl. B31b *31/02*

U.S. Cl. 156—494 **4 Claims**



1. An apparatus for producing stretched solid thermoplastic sheet material comprising an axially rotating blow head for blowing a tubular sheet of solid thermoplastic sheet material, a pair of heated squeeze rollers disposed adjacent the blow head for flattening and welding together the blown tubular sheet of solid thermoplastic material, a pair of rotatably mounted disks disposed adjacent and after the heated squeeze rollers in contact with the edges of the flattened and welded together sheet material, heating means arranged to apply heat to the edges of the sheet material contacting the disks, the disks being disposed at a divergent angle with respect to the edges of the sheet material, pressure applying means disposed on the opposite sides of said sheet material from the disks and adjacent the disks for applying pressure to the edges of the sheet material to urge them in forceful contact with the circumferential surfaces of the disks whereby the formation of air pockets between the edges and the disks is prevented and the edges are maintained in firm engagement with the circumferential surface of the disks by atmospheric pressure to laterally stretch the sheet of thermoplastic material in accordance with the divergent angle of the disks without using any mechanical means gripping over the edges of the sheet, and the distance between the axially rotating blow head and the pair of heated squeeze rollers is approximately from one-half to ten times the diameter of the outlet from the axially rotating blow head.

3,884,749

MACHINE FOR THE MANUFACTURE OF WOOD FIBRE PANELS IN CONTINUOUS LENGTHS

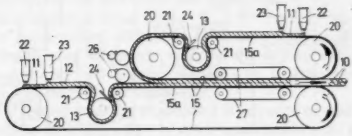
Christa Pankoke, Am Jahnplatz 10, 4800 Bielefeld, Germany

Filed Sept. 12, 1972, Ser. No. 288,294

Claims priority, application Austria, Sept. 13, 1971, 7940/71; Switzerland, Nov. 30, 1971, 017444/71

Int. Cl. B30b *3/00, 5/06*

U.S. Cl. 156—501 **10 Claims**



3. In a machine for continuously producing from a material which is in comminuted form and includes a binder which will set when heated, a sheet having a pair of opposed faces providing the sheet with a cross sectional configuration having a straight line at one of said opposed faces and a predetermined profile at the other of said opposed faces, an endless belt, guide rollers supporting said belt, a first feeding device depositing on said belt a continuous layer of said material, a second feeding device depositing ridges of said material on the layer deposited by said first-feeding device, a pressure roller formed with grooves extending around the surface thereof, said belt and said layer with ridges thereon passing around said pressure roller to form said ridges into ribs, and means for applying heat to the ribbed layer to set said binder, said conveyor belt being provided in each region between adjacent ribs with an insulating strip transmitting less heat than the portions of said belt below the ribs.

3,884,750

METHOD OF RECOVERING SEPARATE FIBER FRACTIONS FROM CORRUGATED BOARD

Fred D. Iannazzi, Andover, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Continuation of Ser. No. 291,950, Sept. 25, 1972, abandoned. This application July 5, 1974, Ser. No. 486,073

Int. Cl. D21c *5/02*

U.S. Cl. 162—4 **20 Claims**

19. A method for separating the fiber fraction forming the corrugated medium, having low moisture resistance or high water receptivity, from the fiber fraction forming the linerboard, having high moisture resistance, or low water receptivity, in corrugated board, comprising the steps of

a. reducing corrugated board stock to intermediate-sized pieces no larger than about six inches in any one dimension;

b. introducing said intermediate-sized pieces of corrugated stock into water for dispersion therein;

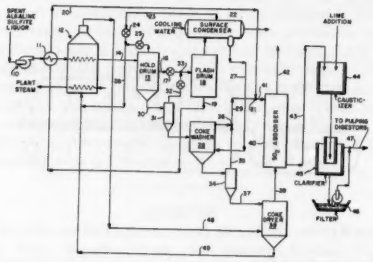
c. subjecting said corrugated stock in water to differential size reduction by mechanical action, the temperature of said water and the length of time and energy level input of said mechanical action being adjusted to separate said corrugated medium from said linerboard and to reduce said corrugated medium fraction to fibers or small pieces no larger than about three-eights inch in any one dimension while retaining substantially all of the linerboard fraction in the form of larger or intermediate-sized pieces; and

d. separating said fibers and small pieces of said corrugated medium fraction from said linerboard fraction.

3,884,751
COKING OF SPENT PULPING LIQUORS USED IN THE ALKALINE SULFITE PROCESS

Howard V. Hess, Glenham; Edward L. Cole, Fishkill, and William F. Franz, Gardiner, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Apr. 25, 1972, Ser. No. 247,379
Int. Cl. D21c 11/02; C21c 11/14
U.S. Cl. 162—31 **2 Claims**



1. In the coking of spent pulping liquors used in the Alkaline Sulfite Process which have a pH of about 9 to about 12; the steps of:

coking said liquors in the liquid phase in a coking zone at about 450°F. to about 750°F. under a pressure of about 100 to about 3000 psig for about 0.5 minute to about 6 hours to form gases including CO_2, liquid effluent and coke; separating said gases, said effluent and said coke; flowing said gases to a combustion zone wherein malodorous sulfur compounds are converted to SO_2; vaporizing a portion of said effluent and cooling the remainder by heat exchange with incoming liquor to preheat said liquor; flowing said vaporized portion of said effluent to a condensing zone; condensing said portion to form a condensate; washing said coke with said condensate to remove sodium ions and other pulping chemicals retained on said coke;

combining said condensate now containing chemicals recovered from said coke, with the cooled effluent and conveying the combined stream to an SO_2-containing absorbing zone;

drying said coke with flue gas, burning said coke in a combustion zone to provide useful heat, to incinerate aforementioned sulfur-bearing gases and to generate an SO_2-bearing flue gas;

then flowing said flue gas to said SO_2 absorbing zone; venting off the pollutant-free fluw gas obtained thereby;

flowing said liquid stream to a causticizing zone, and adding lime to said stream to convert sodium carbonate produced therein by reaction with CO_2 produced by said coking to NaOH and clarifying said stream to remove solids resulting from causticizing, thereby forming new cooking liquor having a pH suitable for alkaline sulfite pulping.

3,884,752
SINGLE VESSEL WOOD PULP BLEACHING WITH CHLORINE DIOXIDE FOLLOWED BY SODIUM HYPOCHLORITE OR ALKALINE EXTRACTION

Robert T. Campbell; Laurence B. Ritter, both of Mobile, Ala., and Joseph G. Land, Jr., Panama City, Fla., assignors to International Paper Company, New York, N.Y.

Filed Sept. 17, 1973, Ser. No. 398,165
Int. Cl. D21c 9/14
U.S. Cl. 162—89 **31 Claims**

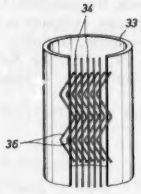
9. In the process of bleaching pulp wherein the pulp is sequentially subjected to a conventional chlorine dioxide treatment and then an alkaline extraction treatment, wherein in said chlorine dioxide treatment chlorine dioxide is added to said pulp in an amount such that substantially all of said chlorine dioxide is consumed in said chlorine dioxide treatment, the improvement which comprises sequentially conducting said conventional chlorine dioxide treatment and said alkaline extraction treatment in the same vessel and without draining the pulp between said treatments.

10. In the process of bleaching pulp wherein the pulp is sequentially subjected to a conventional chlorine dioxide treatment and then a hypochlorite treatment, wherein in said chlorine dioxide treatment chlorine dioxide is added to said pulp in an amount such that substantially all of said chlorine dioxide is consumed in said chlorine dioxide treatment, the improvement which comprises sequentially conducting said chlorine dioxide treatment and said hypochlorite treatment in the same vessel and without draining the pulp between said treatments.

3,884,753
OPEN TUBE WITH NET OVERLAY

George S. Nalle, Jr., 108 W. 2nd St., Austin, Tex. 78701

Continuation of Ser. No. 167,929, Aug. 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 762,519, Sept. 25, 1968, Pat. No. 3,620,883. This application Dec. 17, 1973, Ser. No. 425,268
Int. Cl. B32b 1/00
U.S. Cl. 428—36 **10 Claims**



1. An extruded plastic product which comprises: an elongated hollow tubular member of extrudable thermoplastic having a configuration generally corresponding to a hollow cylinder having an open segment extending the length of said member to define a self-supporting trough shaped member; and a set of filaments of extrudable thermoplastic extending transversely with respect to the open segment of said tubular member, each of the filaments of said set being fused to a surface of said tubular member to define an overlay proximate the open segment of said member.

3,884,754
HOLLOW FILAMENTS AND PROCESS FOR PRODUCING SAME

Isao Kimura, and Hiroaki Koyama, both of Osaka, Japan, assignors to Kaneon, Ltd., Tokyo and Nippon Kynol Inc., Osaka, both of, Japan

Filed Feb. 21, 1973, Ser. No. 334,200
Claims priority, application Japan, Feb. 22, 1972, 47-18750
Int. Cl. B28b 3/20; D02g 3/00
U.S. Cl. 161—178 **13 Claims**

1. A hollow filament comprising a filamentary polymer composed of from 50% to 100% by weight of a flame-resistant and anti-fusing cured novolak resin and up to 50% by weight of a fiber-forming thermoplastic synthetic resin selected from at least one of the group consisting of polyamides, polyesters, polyesterethers, polyolefins and polyurethanes, characterized in that the hollow structure continuously extends in the axial direction of the filament, the degree of hollowness thereof being in the range of 10-80%.

3,884,755

CLOSED CYCLE PAPER SHEET PRODUCTION

Arthur W. Frost, III., Lansdowne, Pa., assignor to GAF Corporation, New York, N.Y.

Filed June 18, 1973, Ser. No. 371,242
Int. Cl. D21f 1/66
U.S. Cl. 162—190 26 Claims

1. An improved process for the production of constuction paper sheets comprising:

a. blending fibrous stocks including groundwood stock having dissolved solids therein, together with water, in a milling zone to produce an aqueous suspension of said stocks;

b. dewatering said suspension in a sheet fabrication zone as to fabricate said paper sheets;

c. removing particulate objects and suspended fiber from the waste water stream removed from said fabrication zone, thereby producing an effluent aqueous stream having dissolved and colloidal material present therein, said stream having a relatively high BOD loading;

d. separating said colloidal material from the effluent aqueous stream as a sludge of waste solids material;

e. blending said sludge and groundwood stock so as to coat individual strands of the wood fibers with said sludge;

f. recycling essentially all of said effluent aqueous stream having dissolved solids therein to said milling zone as make-up water for blending with additional quantities of said fibrous stocks; and

g. recycling said sludge coated on the fibers of said groundwood stock to the milling zone, the sludge-coated wood fibers serving as said wood stock components of the aqueous suspension produced in the milling zone, essentially all of said sludge separated from the effluent aqueous stream thus being recycled to said milling zone,

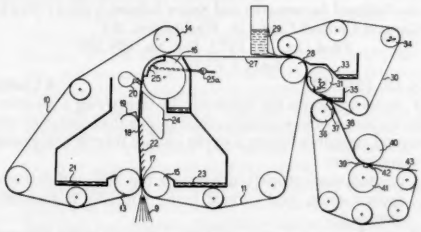
whereby said sheet is produced essentially without discharge of high BOD aqueous effluent to waste and without undesired sludge accumulation, the disruption of the orientation of the fibers of the resulting sheet, with accompanying adverse effect on the properties and quality of the sheet, occasioned by the incorporation of loose sludge particles in the aqueous suspension being substantially obviated by the indicated coating of said sludge on the individual strands of wood fiber prior to incorporation into said aqueous suspension, the properties of the resulting sheet thus being comparable to those of said sheet produced without the recycle and incorporation of said sludge therein.

3,884,756

MULTI-PLY LINERBOARD MACHINE WITH VERTICAL AND HORIZONTAL FORMING RUNS

David R. Gustafson, Rockton, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Sept. 27, 1973, Ser. No. 401,170
Int. Cl. D21f 1/00
U.S. Cl. 162—299 13 Claims



1. A mechanism for making a multi-ply sheet from fibrous stock comprising in combination:

first and second looped forming wires;

first and second guide means within the respective wires training them to travel in a vertically extending forming throat leading to a vertically running forming run between the wires;

a first headbox having a slice positioned to discharge stock vertically into said throat to form a first web layer;

a suction couch roll within the second wire at the end of the forming run;

a breast roll within the second wire downstream from the forming run positioned horizontally of the couch roll so that the second wire extends through a horizontal run to the breast roll and wraps the breast roll;

a third looped forming wire;

third guide means within the third wire training the third wire to wrap said breast roll over the second wire so that a multi-ply web on the second wire is dewatered outwardly through the third wire;

and a second headbox positioned in advance of said breast roll for directing a flow of stock horizontally onto the first web layer during said horizontal run to be dewatered through said third wire over the breast roll.

3,884,757

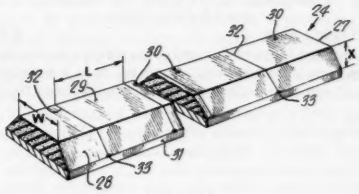
INSERT FOR PAPER MACHINE DRAINAGE ELEMENTS

Oliver J. Beacom, 141 Arrowhead Cresent, Pointe Claire, Quebec, and Donald G. MacBean, 13241 Aragon St., Pierrefonds, Quebec, both of Canada

Continuation-in-part of Ser. No. 118,767, Feb. 25, 1971, Pat. No. 3,732,142. This application Jan. 22, 1973, Ser. No. 325,079

Claims priority, application Canada, Mar. 10, 1970, 077028The portion of the term of this patent subsequent to May 8, 1990, has been disclaimed.

Int. Cl. D21g 9/00
U.S. Cl. 162—374 7 Claims



1. A replaceable drainage element for paper machines, said drainage element having an elongated body formed with a supporting surface and a diverging surface, an insert receiving groove in said supporting surface longitudinally of said body and located a short distance behind a leading edge of said body, said insert receiving groove having opposed side walls the upper portion of which defines an undercut section terminating in a channel section in the base of said groove, a wear resistant insert removably retained securely within said groove and unaffected by the differential in expansion between said body and said wear resistant insert at operating temperatures of said paper machine, said insert being formed of a plurality of discrete elongated elements glued to a backing plate and maintained in end abutting relationship.

3,884,758

TRIGLYCERIDE-ACCUMULATING CLONAL CELL LINE

Howard Green, Boston, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 30, 1974, Ser. No. 438,042
Int. Cl. C12k 9/00
U.S. Cl. 195—1.8 10 Claims

1. A process for screening drugs for their effect on cell accumulation of lipid comprising culturing isolated, clonal, adipose-like, 3T3-L1 cells with the drug to be screened in the presence of culture medium and subsequently detecting the amount of lipid accumulated by said 3T3-L1 cells.

3,884,759

METHOD FOR PRODUCING ERGOSTEROL AND ITS ESTERS

Yoshio Nakao; Mitsuzo Kuno, both of Osaka, and Masaru Suzuki, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 19, 1973, Ser. No. 325,116
Claims priority, application Japan, Jan. 28, 1972, 47-10765
Int. Cl. C12d 5/00
U.S. Cl. 195—28 R 16 Claims

1. A method for producing ergosterol, its esters or a mixture thereof which comprises inoculating a microorganism capable of accumulating ergosterol, its esters or a mixture thereof extracellularly belonging to the genus Trichoderma, the genus Fusarium or the genus Cephalosporium in a culture medium; cultivating the culture until ergosterol, its esters or a mixture thereof is accumulated extracellularly; and recovering ergosterol, its esters or a mixture thereof from the culture broth.

3,884,760

PRODUCTION OF UROKINASE

Nathan H. Sloane, 1842 Brookside Dr., Germantown, Tenn. 38038

Filed Apr. 1, 1974, Ser. No. 456,553
Int. Cl. C07g 7/026
U.S. Cl. 195—66 B 4 Claims

1. A method for purifying and concentrating urokinase from a solution by adsorbing said urokinase onto a suspention of uric acid and then recovering the urokinase from the adsorbent.

3,884,761

BONDING OF ENZYMES, ENZYME DERIVATIVES AND OTHER COMPOUNDS TO POLYMERIC MATERIALS

David Thomas Cowling, Suffolk, England, assignor to Koch-Light Laboratories Limited, Buckinghamshire, England

Filed Dec. 4, 1972, Ser. No. 311,924
Claims priority, application United Kingdom, Dec. 6, 1971, 56621/71
Int. Cl. C07g 7/02
U.S. Cl. 195—68 6 Claims

1. A method of making a hydrophilic water-insoluble polymer with molecular chains having repeating thiol side groupings to which biologically active molecules are attached to give a combined water-insoluble polymer and biologically-active molecule comprising,

a. polymerizing an N-substituted thiazolidine in the presence of an inert gas to give a polymer having thiazolidine side groups,

b. hydrolyzing said thioazolidine side groupings to give a polymer having thiol side groupings, and

c. bonding biologically active molecules through the thiol side groups to the hydrophilic water-insoluble polymer.

3,884,762

FERMENTATION PROCESS FOR THE PREPARATION OF ERGOT ALKALOIDS

Géza Wack; Lajós Nagy; Dénes Székély; József Szolnoky; Eva Udvardy-Nagy, and Erzsebét Zsóka, all of Budapest, Hungary, assignors to Richger Gedeon Vegyeszeti Gyar RT, Budapest, Hungary

Filed June 27, 1973, Ser. No. 374,105
Claims priority, application Hungary, July 21, 1972, OE 11471
Int. Cl. C12d 13/00
U.S. Cl. 195—81 2 Claims

1. A fermentation process for the preparation of ergot alkaloids, mainly ergocryptine and ergocornine, by cultivating a *Claviceps purpurea* strain on a liquid, aerated culture broth containing saccharose and an inorganic nitrogen source, in which a *Claviceps purpurea* variant strain deposited with the National Institute of Public Health (Orszagos Kozegeszsegugyi Intezet), Budapest, Hungary, under No. 88/1972 is used as Claviceps strain.

3,884,763

PRODUCTION OF RIFAMYCIN S AND RIFAMYCIN SV BY MICROMONOSPORA CHALCEA

Walter D. Celmer, New London; Walter P. Cullen, East Lyme, and John B. Routien, New London, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Mar. 11, 1974, Ser. No. 450,071
Int. Cl. C12d 9/14
U.S. Cl. 195—96 2 Claims

1. A process for producing rifamycin S and rifamycin SV which comprises aerobically propagating *Micromonospora chalcea* ATCC 21994 in an aqueous nutrient medium and separating the rifamycins therefrom.

3,884,764

METHOD AND COMPOSITION FOR BLOOD SERUM CHOLESTEROL ANALYSIS

Charles T. Goodhue, Rochester; Hugh A. Risley, Ontario, and Roy E. Snoke, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,622
Int. Cl. C12k 1/04
U.S. Cl. 195—103.5 R 86 Claims

1. An aqueous test solution useful in the quantitative assay of a sample for total cholesterol content comprising:

a. a lipase having cholesterol esterase activity;

b. a protease; and

c. cholesterol oxidase said test solution being buffered to a pH of between about 5.5 and 8.5.

3,884,765

AUTOMATIC MICROBIAL TRANSFER DEVICE

Judd R. Wilkins, and Stacey M. Mills, both of Hampton, Va., assignors to The United States of America as represented by the National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Oct. 26, 1973, Ser. No. 409,990
Int. Cl. C12b 1/02
U.S. Cl. 195—127 6 Claims

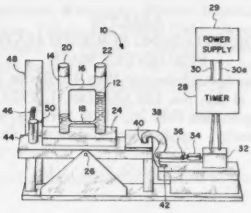
1. In an apparatus for automatically tranferring a predetermined volume of inoculated culture from a first container into a second container having a sterile culture therein comprising in combination:

a pivoted support surface having a top side and first and second ends, said surface being normally horizontally disposed;

first and second containers, said containers being disposed on said top side of said support surface;

a horizontally disposed conduit connected between said first and second containers for permitting flow of said inoculated culture from said first container through said

conduit into said second container upon pivoting of said support surface from the horizontal; and



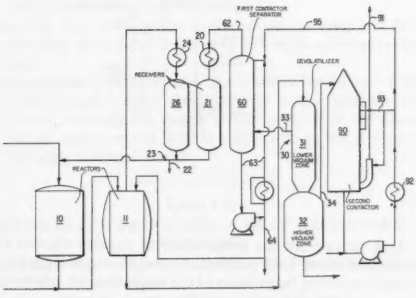
pivoting means mechanically coupled to said support surface for automatically pivoting said support surface from its normal horizontal positon upon occurrence of a predetermined condition.

3,884,766

RECOVERY OF ALKENYL-AROMATIC MONOMERS BY FALLING STRAND DEVOLATILIZATION

Wallace G. Bir, Creve Coeur, Mo., and Joseph Novack, Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 9, 1973, Ser. No. 339,783
Int. Cl. B01d *3/02*
U.S. Cl. 202—173 **8 Claims**



1. An apparatus for the continuous on-line recovery of alkenylaromatic monomer from a stream containing alkenylaromatic monomer, alkenylaromatic high polymer, alkenylaromatic oligomer, high boiling organic compounds and inert hydrocarbons, and for reducing the concentration of alkenylaromatic oligomers and high boiling organic compounds in said recovered alkenylaromatic monomer, said apparatus comprising in combination

A. a two-stage falling strand devolatilizing means for an alkenylaromatic polymer-monomer melt, comprising a heating means for said melt mounted integrally above first and second flash vaporization chambers positioned respectively in contiguous descending vertical relationship and communicating with one another, means for producing a different vacuum within each of said flash vaporization chambers and means for maintaining an elevated temperature in said chambers;

B. a first contacting and separation means for bringing into direct and intimate contact a vapor stream from the said first flash vaporization chamber of said volaüilizing means and a liquid stream and for thereafter separating said vapor stream from said liquid stream, comprising an enclosed vessel having a plurality of perforated sieve trays carrying said liquid stream and permitting direct and intimate contact with said vapor stream passing upwardly through said perforations in said trays and the liquid stream carried thereby, and a separation zone for separating said vapor stream from said liquid stream;

C. a second contacting means for bringing into direct and intimate contact a vapor stream from said second flash vaporization chamber of the devolatilizing means and a cooled liquid stream sufficiently to condense substantially all of said vapor stream;

D. conduit means establishing communication between said first flash vaporization chamber and said first contacting and separation means; and

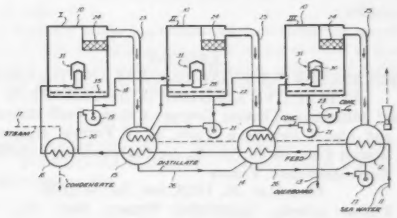
E. conduit means establishing communication between said second flash vaporization chamber and said second contacting means.

3,884,767

MULTI-EFFECT FLASH EVAPORATOR

John E. Pottharst, Jr., 861 Carondelet St., New Orleans, La. 70130

Filed Sept. 21, 1973, Ser. No. 399,375
Int. Cl. B01d *3/00, 3/02, 1/28, 1/26, 1/00*
U.S. Cl. 202—174 **5 Claims**



1. In a multi-effect flash evaporator system wherein means are provided for preheating water and then flashing same into a vessel to provide steam and unflashed water and wherein a mist eliminator is provided through which the flashed steam passes to thereafter be condensed as distilled water, the improvement in combination therewith of a preheated water inlet header extending horizontally and at least partially across said vessel and including a plurality of upwardly directed restricted discharge means spaced along the header for discharging upwardly from the header the preheated feedwater which is to be flashed, and means forming a flash chamber comprising a roof for receiving the upwardly discharged water from said discharge means, said flash chamber extending along and generally above said discharge means and having substantially imperforate side walls which extend downwardly on both sides of the header and forming flow passages therewith so that flashed steam as well as unflashed water is directed to flow downwardly through said flow passages, said means forming a flash chamber being disposed at a level below that of the mist eliminator so that steam flowing down through said passages must substantially change its flow direction in order to pass upwardly to said mist eliminator.

3,884,768

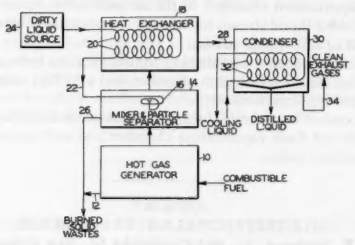
RECLAMATION OF NON-COMBUSTIBLE LIQUIDS BY DIRECT FLAME VAPORIZATION, CENTRIFUGAL SOLIDS SEPARATION AND SUBSEQUENT CONDENSATION

Joseph W. Griffith, 8705 S.W. White Court, Portland, Oreg. 97225

Continuation-in-part of Ser. No. 231,153, March 2, 1972, abandoned. This application July 20, 1972, Ser. No. 273,504
Int. Cl. B01d *3/00, 3/10*
U.S. Cl. 203—11 **6 Claims**

1. The method of reclaiming condensible, non-combustible liquid containing impurities, comprising

a. vaporizing the liquid,
b. mixing the vaporized liquid and impurities with the hot gases of combustion of a combustible fuel,



c. separating the non-combustible solids component of impurities from the mixture by momentum differences, and
d. separating the condensible liquid from the non-condensible vapor component of impurities by condensation.

3,884,769

PROCESS FOR PURIFYING BENZENE AND TOLUENE BY EXTRACTIVE AZEOTROPIC DISTILLATION

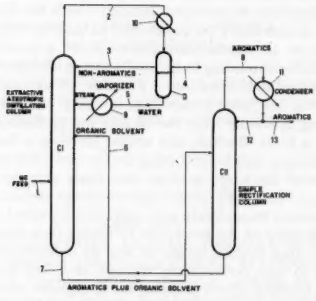
Paul Mikitenko, Chatou; Georges Cohen, Rueil-Malmaison, and Lionel Asselineau, Paris, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed Mar. 20, 1973, Ser. No. 343,108

Claims priority, application France, Mar. 20, 1972, 72.09763

Int. Cl. B01d *3/34;* **C07c** *15/28*

U.S. Cl. 203—53 **10 Claims**



1. A process for separating at least one aromatic hydrocarbon selected from the group consisting of benzene and toluene, from mixtures containing the same together with at least one saturated paraffinic or cycloparaffinic hydrocarbon, in which said mixtures are subjected to an extractive azeotropic distillation in the presence of an extraction solvent in the liquid state, said extraction solvent being an alkyl aliphatic amide, said process comprising introducing the mixture of hydrocarbons to be separated to an intermediate point of a distillation zone, introducing said extraction solvent to a point of the distillation zone above said intermediate point, introducing steam at a point of the distillation zone above the point of introduction of the extraction solvent, withdrawing from the bottom of said distillation zone the aromatic hydrocarbons and the extraction solvent, and withdrawing from the top of said distillation zone, a distillate substantially free of the extraction solvent and containing non-aromatic hydrocarbons and steam.

3,884,770

PROCESS FOR OBTAINING PURIFIED ALCOHOL FROM FERMENTED MASH

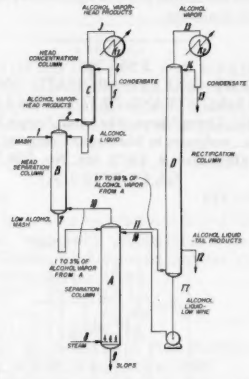
Klaus Misselhorn, Ascheberger Weg 41, Berlin 27, Germany

Continuation of Ser. No. 185,653, Oct. 1, 1971, abandoned. This application Feb. 26, 1974, Ser. No. 446,110

Claims priority, application Germany, Oct. 2, 1970, 2050212

Int. Cl. B01d *3/16, 3/38*

U.S. Cl. 203—82 **1 Claim**

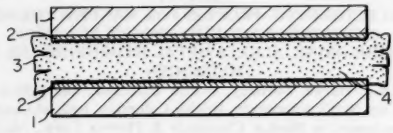


1. A process for the preparation of purified alcohol from fermented mash, said purified alcohol having therein typical aroma imparting ingredients of the mash thereof, said process comprising:
passing said mash into a degassing column;
degassing said mash in said degassing column;
passing the head products containing vapor from said degassing column to a concentration column to obtain a head products concentrate including aroma imparting ingredients of said mash;
returning all of said concentrate to said degassing column to join the degassed mash;
passing said degassed mash and concentrate into a separation column;
separating the alcohol from said mash and concentrate in said separation column and forming an alcohol containing vapor stream;
dividing said vapor stream into a first partial stream and a second partial stream in such a way that 1 to 3 percent of the alcohol in said mash is contained in said first partial stream and 97 to 99 percent of the alcohol in said mash is contained in said second partial stream;
passing said first partial stream into said degassing column as a heat source;
passing said second partial stream into a rectification column and distilling therein said second partial stream; and removing the resultant distilled and purified alcohol, whereby typical aroma imparting ingredients of the raw material used for said mash are retained in said purified alcohol.

3,884,771
PROCESS OF PRODUCING RESINOUS BOARD HAVING A ROUGH SURFACE USABLE FOR FIRMLY SUPPORTING THEREON A PRINTED CIRCUIT

Takayoshi Hanabusa, Kawasaki; Hiroshi Isozuka, Yokohama; Kunioki Miyao, Tokyo, and Morio Gaku, Sagamihara, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed June 21, 1973, Ser. No. 371,995
Claims priority, application Japan, June 29, 1972, 47-65172
Int. Cl. C23b *7/02, 5/58*
U.S. Cl. 204—12 **20 Claims**



1. A process of producing a rigid resinous board having a rough surface effective for firmly supporting thereon a printed circuit, comprising

providing a rough surface metal layer of Sn, Pb, or Zn formed on a base material by way of an electrolytic plating method using an aqueous solution containing at least one compound selected from the group consisting of Sn $(BF_4)_2$, Pb $(BF_4)_2$, K_2SnO_2, $ZnSO_4$, ZnO, $Zn_2P_2O_7$, $SnCl_2$, $ZnCl_2$, $Zn(CN)_2$, and $SnSO_4$;

superimposing at least one prepreg consisting of at least one insulating fibrous substrate impregnated with an insulating synthetic resin liquid half-dried, on the rough surface metal layer of the base material;

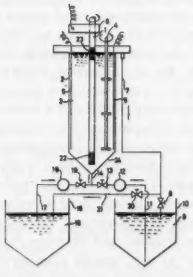
pressing and heating the superimposed prepeg and base material to convert the prepeg to a rigid resinous board; and

removing the base material entirely and at least a part of the plated rough surface metal layer from the rigid resinous board, whereby the rough surface pattern of the plated rough surface metal layer is transferred to the surface of the rigid resinous board.

3,884,772
METHOD FOR PRODUCING A HEAT EXCHANGER ELEMENT

Shoji Shiga, Nikko, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Sept. 25, 1972, Ser. No. 291,626
Claims priority, application Japan, Mar. 6, 1972, 47-23032; Dec. 6, 1971, 46-98548; Sept. 25, 1971, 46-74926; Apr. 11, 1972, 47-35767
Int. Cl. C23b *7/00, 5/00*
U.S. Cl. 204—23 **9 Claims**



1. A method of producing a heat exchanger element having a porous surface layer containing electrodeposited metal and finely divided electroconductive particles, which comprises immersing a substrate for the heat exchange surfaces in a metal-electrodepositing solution containing a source of the metal ions which are to be deposited on the substrate and suspended finely divided electroconductive metal particles having an average particle size of about 0.5 to 500 microns in a concentration of 5 to 500 g/l, and creating a potential difference between the substrate, connected as the cathode, and an anode in the solution, under conditions satisfying the formula $0.6\ T+16>Dc>0.75\ T-18$ wherein T is the temperature of the solution in °C and Dc is the cathode current density in A/dm² within the range of 10–40 A/dm², so as to deposit a mixture of the electroconductive metal particles and metal on the substrate in a weight ratio of particles to metal of not greater than 1:3 and form porous projections having a height of at least 0.05 mm on the substrate.

3,884,773
ELECTRODEPOSITION OF NICKEL

Reuven Merker, Englewood Cliffs, and Salvatore Lucca, Paramus, both of N.J., assignors to The Metalux Corporation, Paterson, N.J.

Filed Aug. 17, 1973, Ser. No. 389,379
Int. Cl. C23b *5/08, 5/46*
U.S. Cl. 204—49 **12 Claims**

1. A bath for producing bright nickel electrodeposits comprising an aqueous acid solution of a nickel salt and at least 0.001 g./l. of a sulfonated ester reaction product of maleic acid and an acetylenic alcohol, said alcohol having the formula

$$RC{\equiv}CC(H_2)(OCH_2CH_2)_nOH$$

wherein R is selected from the group consisting of hydrogen, H_3C-, and $HO(CH_2CH_2O)_nCH_2-$, n is 0-2, and n is 0 when R is hydrogen or H_3C-.

3,884,774
ELECTROLYTIC DEPOSITION OF ZINC

Richard B. Kessler, Jericho, N.Y., assignor to Lea-Ronal, Inc., Freeport, N.Y.

Filed Feb. 1, 1973, Ser. No. 328,782
Int. Cl. C23b *5/10, 5/46*
U.S. Cl. 204—55 Y **6 Claims**

1. An aqueous zincate bath having a pH of about 12 and above for electroplating bright metallic zinc deposits on substrates over a wide current density range which comprises

1. an aqueous alkaline solution containing less than about 2 oz./gal. of cyanide;
2. a soluble zinc compound dissolved therein and capable of plating zinc metal by electrolytic deposition;
3. a substituted pyridine or quinoline compound possessing at least one amino substituent in an amount sufficient to increase the brightness of the zinc deposit electrolytically deposited therefrom over an increased current density range; and
4. an amine brightening agent other than the amino substituted pyridine or quinoline compound in sufficient amount to increase the brightness of the entire deposit.

3,884,775
ELECTROLYTIC PROCESS FOR PRODUCTION OF CHLOROFLUORINATED ETHERS

Shunji Nagase; Hajime Baba; Kazuo Kodaira, all of Nagoya and Kooshi Okazaki, Saitama-ken, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 12, 1973, Ser. No. 340,601
Claims priority, application Japan, June 14, 1972, 47-59185
Int. Cl. B01k *3/00*
U.S. Cl. 204—59 F **2 Claims**

1. A process for production of chlorofluoroethers which comprises, dissolving partially chlorinated ethers in anhydrous hydrogen fluoride to form a solution thereof wherein 1–25% by weight of the partially chlorinated ether based on the anhy-

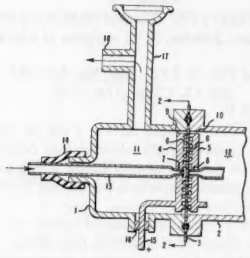
drous hydrogen fluoride is dissolved in the anhydrous hydrogen fluoride, said partially chlorinated ether being one member selected from the group consisting of 2,2'-dichloroethyl ether, pentachloroethylmethyl ether, 2,2,2-trichloroethylmethyl ether, trichlorovinylmethyl ether, allyl-2-chloro-1,1,2-trifluoroethyl ether, 2-chloro-1,1,2-trifluoroethyl-1,2,2-trichloroethyl ether, 2,2,2-trichloro-1,1-difluoroethylmethyl ether, and 2,2-dichloro-1,1,2-trifluoroethyltrichloromethyl ether, electrolyzing said solution in an alternately nickel-plate anode-cathode electrolyzing cell wherein the anode current density is between 0.5 and 4.0 A/dm², bath temperature is between −10° and +20°C and bath voltage is between 4 and 9 V., removing impurities and by-products from gas evolved from the electrolyzing cell and thereafter recovering chlorofluoroethers, said chlorofluoroethers being the same in construction and in number of carbon atoms as said partially chlorinated ethers and being selected from the group consisting of 2-chloro-1,1,2,2-tetrafluoroethyltrifluoromethyl ether, 2-chloro-1,1,2,2-tetrafluoroethyldifluoromethyl ether, 2,2-dichloro-1,1,2-trifluoroethyltrifluoromethyl ehter, 2,2-dichloro-1,1,2-trifluoroethyldifluoromethyl ether, chlorodifluoromethylmethyl ether, 1-chloro-1,1,2,2-tetrafluoroethylchlorodifluoromethyl ether, 2,2-dichloro-1,1,2-trifluoroethylchlorodifluoromethyl ether, 2,2-dichloro-1,1,2-trifluoroethyldichlorofluoromethyl ether.

3,884,776

PREPARATION OF HYDROQUINONE

Frederick Andrew Keidel, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed May 15, 1973, Ser. No. 360,427
Int. Cl. C07c *39/08, 37/00;* **C07b** *29/06*
U.S. Cl. 204—73 R **11 Claims**



1. The process for preparing hydroquinone from benzene in a single electrolytic cell having an anode and a cathode separated by an ion-permeable membrane which comprises

A. anolyzing a dispersion of benzene phase in aqueous anolyte at the anode electrode, thereby producing benzene enriched with quinone while

B. simultaneously catholyzing a dispersion in aqueous catholyte of benzene phase enriched with quinone at the cathode electrode, thereby producing a benzene phase of lowered quinone content and aqueous catholyte phase enriched with hydroquinone,

C. separating the benzene phase enriched with quinone from the aqueous anolyte and dispersing it in the aqueous catholyte,

D. separating the benzene phase of lowered quinone content from the aqueous catholyte phase and dispersing it in the aqueous anolyte, and

E. recovering hydroquinone from an aqueous phase,

wherein the aqueous catholyte contains at least one member of a redox couple, which can be converted from the reduced to the oxidized form at a standard potential at least as positive as 0.7 volts, in an amount sufficient to accelerate the reduction of quinone to hydroquinone, the couple comprising an oxidized and a reduced form wherein

A. both the oxidized and reduced forms are soluble in the catholyte,

B. the oxidized form is electrochemically reducible to its reduced form, and

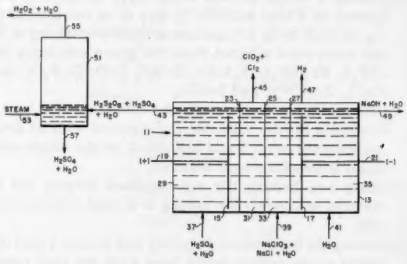
C. the reduced form is capable of chemically reducing quinone to hydroquinone and thereby be converted to the oxidized form.

3,884,777

ELECTROLYTIC PROCESS FOR MANUFACTURING CHLORINE DIOXIDE, HYDROGEN PEROXIDE, CHLORINE, ALKALI METAL HYDROXIDE AND HYDROGEN

Cyril J. Harke, Burnaby, British Columbia, and Jeffrey D. Eng, North Vancouver, British Columbia, both of Canada, assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Jan. 2, 1974, Ser. No. 429,998
Int. Cl. C01b *11/02;* **C01d** *1/06;* **B01k** *3/00*
U.S. Cl. 204—84 **11 Claims**



11. A method of manufacturing chlorine dioxide, hydrogen peroxide, chlorine, substantially alkali metal chloride-free aqueous alkali metal hydroxide and hydrogen from alkali metal chloride, alkali metal chlorate, sulfuric acid and water which comprises electrolyzing with a direct current, in a cell having an anode in an anode compartment, a cathode in a cathode compartment and a plurality of intermediate buffer compartments, with the anode compartment being separated from a buffer compartment by a cation-active permselective membrane, the cathode compartment being separated from a buffer compartment by a cation-active permselective membrane and at least one buffer compartment being separated from another by an anion-active permselective membrane, electrolytes resulting from feeds of sulfuric acid to the anode compartment, alkali metal chloride and alkali metal chlorate to a buffer compartment nearer to the cathode compartment than another buffer compartment, and water to the cathode compartment, so that with the passage of direct electric current through the cell hydrogen ions selectively pass from the anode compartment to an adjacent buffer compartment through the cation-active permselective membrane, chloride and chlorate ions selectively pass from a buffer compartment nearer to the cathode compartment to another buffer compartment through an anion-active permselective membrane, and alkali metal cations selectively pass from a buffer compartment to the cathode compartment through a cation-active permselective membrane, sulfuric acid is converted to persulfuric acid in the anode compartment, chloride and chlorate ions react to produce chlorine and chlorine dioxide in a buffer compartment nearer to the anode compartment than the buffer compartment into which chloride and chlorate are fed, and water and alkali metal cations are converted to aqueous, substantially alkali metal halide-free alkali metal hydroxide and hydrogen in the cathode compartment, and removing from the electrolytic cell the persulfuric acid solution, chlo-

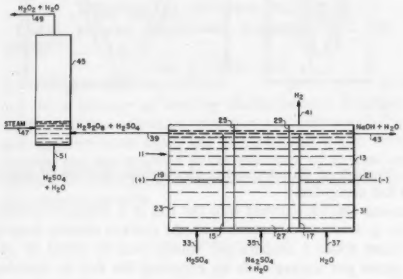
rine dioxide, chlorine, aqueous alkali metal hydroxide and hydrogen produced.

3,884,778

ELECTROLYTIC PRODUCTION OF HYDROGEN PEROXIDE AND ALKALI METAL HYDROXIDE

Jeffrey D. Eng, North Vancouver, British Columbia, and Cyril J. Harke, Burnaby, British Columbia, both of Canada, assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,004
Int. Cl. C01b *11/02*; C01d *1/06*; B01k *3/00*
U.S. Cl. 204—84 **11 Claims**



11. A method for electrolytically manufacturing persulfuric acid and aqueous alkali metal hydroxide from the sulfuric acid and alkali metal sulfate which comprises electrolyzing in a cell having an anode compartment with an anode therein, a cathode compartment with a cathode therein, and one or more intermediate buffer compartments separating the anode and cathode compartments, an anion-active permselective membrane separating the anode and buffer compartments, and a cation-active permselective membrane separating the buffer and cathode compartments, solutions resulting from feeding sulfuric acid to the anode compartment and alkali metal sulfate to one or more buffer compartments, so that with the passage of direct electric current through the cell, sulfate anion selectively diffuses from the buffer compartment to the anode compartment through the anion-active permselective membrane, sodium cation selectively diffuses from the buffer compartment to the cathode compartment through the cation-active permselective membrane, sulfuric acid is oxidized at the anode to produce a sulfuric acid solution of persulfuric acid, and sodium cation is reacted with water at the cathode to produce hydrogen and aqueous alkali metal hydroxide solution, withdrawing the persulfuric acid solution from the anode compartment and withdrawing the hydrogen and alkali metal hydroxide solution from the cathode compartment.

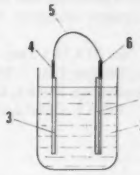
3,884,779

METHOD FOR THE CONTROLLED FORMATION OF THE LAYER OF COPPER SULPHIDE OF A CADMIUM SULPHIDE PHOTOCELL

Thuoc Nguyen Duy, Ivry, and Wolfgang Palz, Paris, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed May 24, 1973, Ser. No. 363,424
Int. Cl. C01b *17/00*
U.S. Cl. 204—92 **4 Claims**

1. A method for the controlled formation of the layer of Cu_2S of a CdS—Cu_2S photocell through ion exchange by immersion in a solution of cuprous ions, the photocell being produced being maintained throughout the duration of its immersion in said solution at a constant positive or zero potential with respect to metallic copper immersed in the same solution.

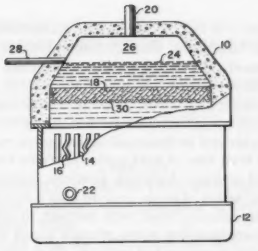


3,884,780

ABSORPTION OF GASEOUS CELL PRODUCT IN CELL LIQUOR

Edward H. Cook, Jr., and Morris P. Grotheer, both of Lewiston, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 755,845, Aug. 28, 1968, Pat. No. 3,616,443. This application Oct. 21, 1971, Ser. No. 191,533
Int. Cl. C01b *11/26*; B01k *3/00*
U.S. Cl. 204—95 **2 Claims**

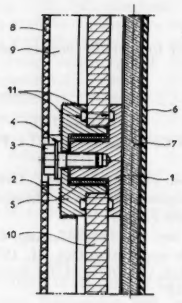


1. In the process for the production of an oxy-halogen acid selected from hypochlorous acid and hypobromous acid, by the electrolysis of a halide containing brine in electrolytic cell, said halide being selected from chloride and bromide, wherein said brine is electrolyzed between anode and cathode members in said cell to form a halogen anode product corresponding to the halide of said brine, a cell liquor containing water and the said oxy-halogen acid and a hydrogenous gaseous cathode product, which cathode product has entrained therein a portion of the halogen anode product, the improvement which comprises passing said gaseous cathode product containing the entrained halogen upwardly in the cell through a layer of inert, absorptive packing material, which layer is pervious to said gaseous cathode product and is disposed completely above the anode and cathode members of the cell but at least partially below the upper surface of the cell liquor in the cell, maintaining the upper surface of the cell liquor above the anode and cathode members but below the top of the cell so as to form a gas disengaging zone between the top of the cell and the upper surface of the cell liquor in which separation of the gases from the cell liquor is effected, dispersing said gaseous cathode product in said cell liquor so as to effect intimate mixing of the cell liquor and the gaseous cathode product as it passes through said packing material, and, thereby, reacting the halogen in said gaseous cathode product with the water in the cell liquor to form additional oxy-halogen acid.

3,884,781
PROCESSES FOR THE ELECTROLYSIS OF ALKALI HALIDES EMPLOYING DISMANTLEABLE BIPOLAR ELECTRODES

Pierre Bouy, Ehghien-Les-Bains, and Guillaume Malzac, Martigues, both of France, assignors to Rhone-Progil, Paris, France

Division of Ser. No. 314,783, Dec. 13, 1972, Pat. No. 3,824,173. This application Jan. 7, 1974, Ser. No. 431,024
Claims priority, application France, Dec. 22, 1971, 71.46072
Int. Cl. C01d 1/06
U.S. Cl. 204—98 1 Claim



1. Processes for the electrolysis of alkali halides in an electrolytic cell employing dismantleable bipolar electrodes in which the anodically active portion comprises a film-forming metal or alloy thereof, covered with a corrosion-resistant, electrical-conducting layer, and in which the cathodically active portion comprises a metal which can be used cathodically, characterized in that said active portions are separated in space, at least one of said active portions being apertured, an electrical contact between portions being produced by means of two series of parts, each of said series being mechanically and electrically fixed with respect to one of said portions, the corresponding parts of each series being of shapes such that once connected in order to form pairs of parts, said pairs define a sealed cavity for housing a device or means for establishing an electrical contact between the parts of each pair, which process comprises feeding an alkali halide to said electrolytic cell employing said dismantleable bipolar electrodes and applying an electrical current to the said dismantleable bipolar electrodes to electrolyze the alkali halide.

3,884,782
ELECTROLYTIC COPPER RECOVERY METHOD AND ELECTROLYTE

Tobe A. Pittman, 603 S. 400 West, Centerville, Utah 84014, and Jack L. Woods, 1517 9th St., Ogden, Utah 84404

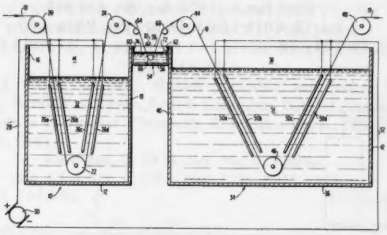
Filed Apr. 8, 1974, Ser. No. 458,887
Int. Cl. C22d 1/16
U.S. Cl. 204—108 9 Claims

1. An electrolytic process for the recovery of high purity copper from copper containing ores which comprises the steps of (a) extracting copper from the ore in an aqueous solution containing from 10 to 1000 grams per liter of an inorganic acid; from 0.1 to 10 grams per liter of an oxidizing agent; from 0.1 to 20 grams per liter of a water soluble saturated aliphatic alcohol and from 0.1 to 25 grams per liter of a lignin sulfonic acid or salt thereof; and (b) subjecting the copper containing solution from step (a) to a pulsed direct current power source in an electrolytic cell wherein the pulse current is from 1.1 to 99.1 times the average current flow thereby depositing high purity copper at the cathode.

3,884,783
DIRECT CURRENT ELECTROLYTIC ETCHING OF ALUMINUM FOIL WITHOUT THE USE OF CONTACT ROLLS

Lowell W. Austin, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 284,922, Aug. 30, 1972, abandoned. This application Dec. 18, 1973, Ser. No. 425,734
Int. Cl. B23p 1/16, 1/00
U.S. Cl. 204—129.35 2 Claims



1. Method of direct current electrolytic etching of aluminum foil comprising

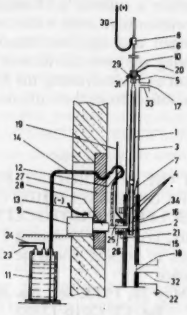
passing electric current into the foil in a contact cell zone to provide an apparent cathode current density ranging from about 1 ampere per square inch to about 20 amperes per square inch by exposing the foil to insoluble anodes in an electrolyte consisting essentially of an aqueous solution containing by weight from about 5 to about 30% sulfuric acid, and

passing electric current from the foil as an anode in an etching zone by exposing the foil to cathodes in an aqueous solution comprising sodium chloride.

3,884,784
PROCESS FOR ELECTRO-CHEMICALLY CUTTING AN IRRADIATED NUCLEAR FUEL ASSEMBLY

Joseph Gerard Wurm, Mol; Jean Van Impe, Rhode St. Genese; Antoine De Coninck, Groot Bijgaarden; Paul Raymond Heylen, Mol, and Jean-Pierre Rombaux, Grimbergen, all of Belgium, assignors to Centre d'Etude de l'Energie Nucleaire, C.E.N.; E.N.I.-Electrische Nijverheids-Installaties and Belgonuclearie, all of Brussels, Belgium

Filed July 3, 1972, Ser. No. 268,800
Claims priority, application Belgium, July 1, 1971, 769377
Int. Cl. B23p 1/16, 1/04
U.S. Cl. 204—129.75 4 Claims



1. A process for electrochemically cutting an irradiated fuel assembly comprising the steps of:

connecting the assembly as an anode into an electric circuit, connecting a tool with a row of channels as a cathode into the electric circuit,

and throwing an electrolyte through the channels against the assembly,

the electrolyte consisting in a molten salt comprising an alkali nitrate, in which a fluoride selected from the group comprising NaF, KF and LiF is dissolved in a concentration of 1–10 mol %.

3,884,785

METHOD OF MAKING DICHLOROACETYL CHLORIDE

Alfred Hoelle, Grenzach, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Oct. 15, 1971, Ser. No. 188,663

Claims priority, application Germany, Oct. 15, 1970, 2050562

Int. Cl. B01j *1/10*

U.S. Cl. 204—158 **8 Claims**

1. In a process of making dichloroacetyl chloride from trichloroethylene through oxidation and utilization of irradiation by short-wave light, the improvement which comprises carrying out the reaction in the presence of at least one salt selected from the group of salts of aliphatic nitrogenous bases and ammonium salts.

3,884,786

HOT MELT COMPOSITIONS PRODUCED BY IRRADIATING ETHYLENE COPOLYMERS IN THE PRESENCE OF WAX

Joseph Dominic Domine, Somerville, and Roy Henry Schaufelberger, Basking Ridge, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 273,542, July 20, 1972. This application Oct. 2, 1973, Ser. No. 402,758

Int. Cl. Bo1j *1/10;* **B01j** *1/12*

U.S. Cl. 204—159.14 **3 Claims**

1. An irradiated concentrate of wax and an ethylene-vinyl acylate copolymer or an ethylene-alkyl acrylate copolymer containing a major amount of said copolymer, wherein the vinyl acylate or the alkyl acrylate content is from 5 to 40 weight percent, said copolymer having an initial melt index of from about 1.5 dgm./min. to about 100 dgm./min., said irradiated concentrate obtained by the steps of (a) producing a concentrate of said wax and said copolymer and (b) irradiating said concentrate with high energy ionizing radiation of an absorbed dose of from 0.01 to 5 megareps to increase the molecular weight of said copolymer and thereby produce said irradiated concentrate.

3,884,787

SPUTTERING METHOD FOR THIN FILM DEPOSITION ON A SUBSTRATE

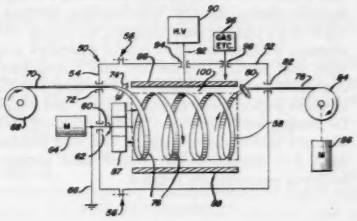
Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.

Filed Jan. 12, 1973, Ser. No. 323,133

Int. Cl. C23c *15/00*

U.S. Cl. 204—192 **30 Claims**

1. Method of coating a thin film on elongate substrate means by electric field sputtering plasma vapor deposition in a pressure vessel which comprises moving the substrate means along a predetermined tortuous and generally circular path established within said vessel while subjecting only the exterior surface of said substrate means to an arcuately configured volume of plasma vapor repeatedly between the ends of the tortuous path, the configuration of the volume of plasma vapor generally conforming to the geometric figure generated by the tortuous path and cathodic target means having the



general configuration of at least a partial cylinder surrounding and substantially uniformly spaced from said path.

3,884,788

SUBSTRATE PREPARATION FOR LIQUID PHASE EPITAXY OF MERCURY CADMIUM TELLURIDE

Ralph B. Maciolek, Hennepin; Richard A. Skogman, Dakota, and Charles J. Speerschneider, Hennepin, all of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Aug. 30, 1973, Ser. No. 393,265

Int. Cl. C23c *15/00;* **B44d** *1/14, 1/18*

U.S. Cl. 204—192 **3 Claims**

1. A method of depositing a layer of mercury cadmium from a liquid solution on to a substrate which does not substantially chemically react with the liquid solution, the method comprising:

sputter etching a surface of the substrate;

sputter depositing a thin layer of cadmium telluride on the surface; and

epitaxially depositing a layer of mercury cadmium telluride by contacting the cadmium telluride coated surface with a liquid solution of mercury, cadmium and tellurium.

3,884,789

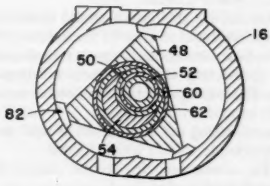
APPARATUS FOR FINISHING TROCHOIDAL SURFACES

Albin S. Czubak, Holland, Mich., assignor to Ex-Cell-O Corporation, Detroit, Mich.

Filed Feb. 22, 1973, Ser. No. 334,734

Int. Cl. B01k *3/00;* **C23b** *5/68*

U.S. Cl. 204—224 R **9 Claims**



1. In an apparatus for finishing an epitrochoidal-shaped surface of a workpiece, including:

a tool holder having finishing tool means mounted thereon;

means for positioning said workpiece with respect to said tool holder;

a mandrel, said tool holder being rotatably supported on said mandrel;

means for eccentrically rotating said tool holder with respect to said mandrel; and

means for synchronizing the eccentric rotation of said holder with respect to said mandrel whereby said holder will trace an epitrochoidal path, the improvement comprising:

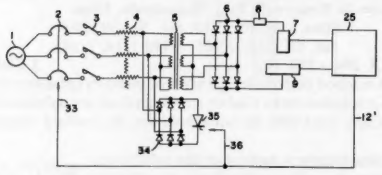
said finishing tool including at least one finishing element adapted to engage the surface of said workpiece and at least one electrically conductive element positionable with respect to said surface for effecting the deposition of metallic plating thereon; said finishing element comprising at least one abrasive element; means for moving said abrasive element into and out of operative engagement with said surface; means on said conductive element engageable with said surface for spacing said conductive element with respect to said surface; and biasing means for biasing said conductive element toward said surface, whereby said abrasive element and said conductive element will simultaneously follow said surface as said holder is eccentrically rotated.

3,884,790

APPARATUS FOR ELECTROLYTICALLY ETCHING

Kazuhiko Kobayashi, Seto; Tamio Takawashi, Nagoya, and Shinji Arai, Nagoya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed June 29, 1973, Ser. No. 374,960
Claims priority, application Japan, July 5, 1972, 47-67216
Int. Cl. B23p 1/02; B01k 3/00
U.S. Cl. 204—224 M **6 Claims**



1. Apparatus for electrolytically etching a workpiece which comprises:

a three phase saturable reactor having an input and an output,

three phase alternating current transformer means having primary windings and second windings,

rectifier means for rectifying three phase alternating current having three inputs and first and second outputs,

an electrode,

an abnormal phenomenon detector,

means connecting the input of said three phase alternating current saturable reactor to a three phase alternating current power source,

means connecting the output of said three phase alternating current saturable reactor to the primary windings of said three phase alternating current transformer means,

means connecting the secondary windings of said three phase alternating current transformer means to the three inputs of said rectifier means,

means connecting the first output of said rectifier means to said electrode,

means for connecting the second output of said rectifier means to said workpiece,

means connecting said abnormal phenomenon detector between said electrode and said workpiece;

an interrupting thyristor,

interrupting diode means,

means connecting said interrupting diode in parallel with the primary windings of said three phase alternating current transformer means,

means connecting said interrupting thyristor to the direct current output of said interrupting diode means,

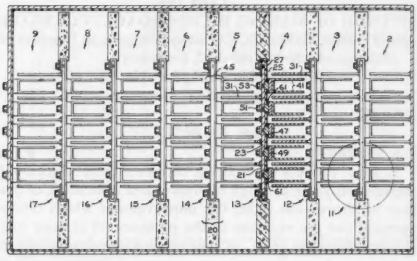
means connecting said abnormal phenomenon detector to said interrupting thyristor to short circuit the primary windings of said three phase alternating current transformer means in response to the detection of an abnormal phenomenon signal.

3,884,791

ELECTROLYTIC CELL HAVING METAL ELECTRODES

Carl W. Raetzsch, and Hugh Cunningham, both of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 30, 1973, Ser. No. 420,744
Int. Cl. B01k 3/00
U.S. Cl. 204—268 **6 Claims**



5. In a bipolar electrolyzer having a plurality of individual bipolar units in series, each of said individual bipolar units including a backplate having an aperture extending therethrough, a steel cathodic surface, cathode means mounted on and extending from said cathodic surface, a titanium anodic surface, and anode means extending from said anodic surface, whereby the anode means of one bipolar unit and the cathode means of the next adjacent bipolar unit are in the same electrolyte compartment, the improvement wherein said anode means is removable independently of said cathode means and comprises:

a titanium anode base member larger than said aperture;

finger-like metal anodes mounted on and extending from one side of said titanium anode base member;

an electroconductive, substantially hydrogen impermeable copper member friction welded to the opposite side of said acid resistant anode base and corresponding to the aperture in the backplate; and

threaded bolt means friction welded to and extending from the hydrogen impermeable copper member through said aperture to the cathodic surface of the backplate, whereby said anode base member applies a compressive force on the titanium anodic surface of said backplate thereby forming an electrolyte tight seal between said titanium anode base member and said backplate.

3,884,792

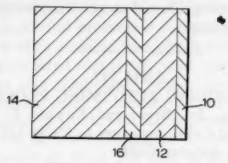
BIPOLAR ELECTRODES

James D. McGilvery, Etobicoke, Ontario, Canada, assignor to Erco Industries Limited, Islington, Ontario, Canada

Filed Sept. 4, 1973, Ser. No. 393,945
Claims priority, application Canada, Sept. 15, 1972, 151886
Int. Cl. B01k 3/06
U.S. Cl. 204—290 F **13 Claims**

1. A bipolar electrode structure comprising an anode surface, a layer of iron or an alloy thereof providing the cathode, a layer of passivatable metal located between the anode surface and the cathode and a layer of an electrically conducting metal or alloy thereof resistant to atomic hydrogen flow therethrough selected from the group consisting of gold, tin, lead,

nickel, cobalt, chromium, tungsten, molybdenum, cadmium and copper, and alloys thereof and located between and in



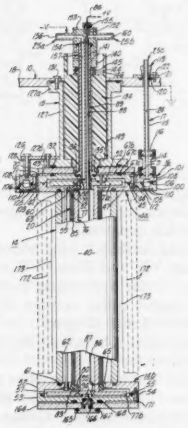
electrical contact with the iron or alloy thereof layer and the layer of passivatable metal.

3,884,793

ELECTRODE TYPE GLOW DISCHARGE APPARATUS

Alan S. Penfold, Playa Del Rey, and John A. Thornton, Los Angeles, both of Calif., assignors to Telic Corporation, Santa Monica, Calif.

Filed Sept. 7, 1971, Ser. No. 178,240
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 **45 Claims**



1. Electrode glow discharge apparatus for sputtering material in a gaseous environment of approximately 10^{-2} torr and below, comprising:

a housing for said environment and means through which said housing can be evacuated;

cathode means from which material is to be sputtered, said cathode means being adapted to be coupled with a power supply and including a central elongated portion and ends extending radially therefrom forming a trap region for high and low energy electrons between the ends contiguous to said central portion, said trap region including a cathode sheath, substantially all of said high energy electrons being generated on the surface of said cathode means by secondary emission;

anode means being adapted to be coupled to a power supply, said anode means being outside said trap region of said cathode means;

magnetic field means for generating a magnetic field of approximately 300 gauss and below within said trap region, said magnetic field having magnetic field lines closely contiguous to and substantially parallel with said central portion of said cathode means, whereby said trap region is formed completely by said magnetic field and surfaces at substantially cathode potential; and

means for supporting within said housing workpieces intended to be sputter coated.

3,884,794

SOLVENT REFINED COAL PROCESS INCLUDING RECYCLE OF COAL MINERALS

Willard C. Bull, Prairie Village; Charles H. Wright, Overland Park, both of Kans., and Gerald R. Pastor, Takoma, Wash., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 4, 1974, Ser. No. 446,973
Int. Cl. C10g *1/00*
U.S. Cl. 208—8 **18 Claims**

1. A process for preparing deashed solid and liquid hydrocarbonaceous fuel from hydrocarbonaceous feed coal containing ash comprising contacting the feed coal with hydrogen and a solvent for the hydrocarbonaceous material in the coal to form a coal-solvent slurry in contact with hydrogen, passing the slurry and hydrogen through a preheater for a residence time between 0.01 and 0.25 hours, said preheater having a length to diameter ratio of at least 100 to inhibit backmixing so that an increment of said slurry gradually increases in temperature in passage through the preheater from a low inlet temperature to a maximum temperature at the preheater outlet, the maximum temperature at the preheater outlet being 400° to 525°C., the viscosity of an increment of the slurry in passage through the preheater increasing intially to a value at least 20 times the viscosity of the solvent along when each is measured at a temperature of 99°C., the viscosity of the slurry when measured a 99°C. subsequently dropping to a value lower than 10 times the viscosity of the solvent alone when each is measured at 99°C. in continued passage through the preheater, the viscosity of said slurry finally tending to increase to a value greater than 10 times that of the solvent along when each is measured at 99°C. at the exit temperature of said preheater but the slurry and hydrogen being removed from said preheater after the relative viscosity drops to a value below 10 but before the relative viscosity finally increases to a value of 10, passing the slurry to a dissolver maintained at a temperature between 350° and 475°F. and which is below the temperature at the outlet of the preheater, the residence time of the slurry in the dissolver being greater than in the preheater, removing the slurry from the dissolver, separating from the slurry an ash-containing stream, a gaseous stream, a fuel product which is liquid at room temperature, and a deashed fuel product which is solid at room temperature, and recycling a portion of the separated ash to said preheater step.

3,884,795

SOLVENT REFINED COAL PROCESS WITH ZONES OF INCREASING HYDROGEN PRESSURE

Charles H. Wright, Overland Park, Kans., and Gerald R. Pastor, Takoma, Wash., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 4, 1974, Ser. No. 446,972
Int. Cl. C10g *1/00*
U.S. Cl. 208—8 **15 Claims**

1. A process for preparing deashed solid and liquid hydrocarbonaceous fuel from hydrocarbonaceous feed coal containing ash comprising contacting the feed coal in a slurry with a solvent for the hydrocarbonaceous material in the coal with a contaminant containing hydrogen stream obtained from the dissolver step described below without scrubbing of contaminant gases, passing the slurry and said contaminant containing hydrogen through a preheater for a residence time between 0.01 and 0.25 hours, said preheater having a length to diameter ratio of at least 100 to inhibit backmixing so that an increment of said slurry gradually increases in temperature in passage through the preheater from a low inlet temperature to a maximum temperature at the preheater outlet, the maximum temperature at the preheater outlet being 400° to 525°C., the viscosity of an increment of the slurry in passage through the

preheater increasing initially to a value at least 20 times the viscosity of the solvent alone when each is measured at a temperature of 99°C., the viscosity of the slurry in continued passage through the preheater subsequently dropping to a value lower than 10 times the viscosity of the solvent alone when each is measured at 99°C., the viscosity of said slurry finally tending to increase to a value greater than 10 times that of the solvent alone when each is measured at 99°C. at the exit temperature of said preheater but the slurry and hydrogen containing contaminant gases being removed from said preheater after the relative viscosity drops to a value below 10 but before the relative viscosity finally increases to a value of 10, flashing hydrogen containing contaminant gases from the slurry, charging relatively purer hydrogen to said slurry, reducing the temperature of the slurry at least 10°C. after it leaves the preheater to a temperature at which the viscosity of the slurry does not increase to a value above 10 times that of the solvent alone when each is measured at 99°C., passing the cooled slurry to a dissolver maintained at a temperature between 350 and 475°C. which is below the temperature at the outlet of the preheater, the residence time of the slurry in the dissolver being greater than in the preheater, the hydrogen partial pressure in the dissolver being greater than in the preheater, removing the slurry from the dissolver and separating the slurry into hydrogen containing contaminant gases, a fraction which is liquid at room temperature and a deashed fraction which is solid at room temperature, passing hydrogen-containing contaminant gases to the preheater, and recycling at least a portion of said liquid fraction as solvent for said preheater step.

3,884,796
SOLVENT REFINED COAL PROCESS WITH RETENTION OF COAL MINERALS

Charles R. Hinderliter, Overland Park, and Russell E. Perrussel, Merriam, both of Kans., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

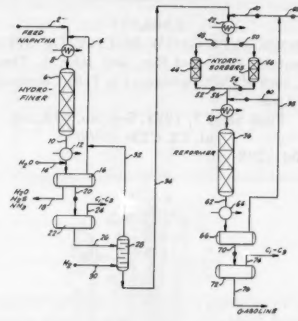
Filed Mar. 4, 1974, Ser. No. 446,974
Int. Cl. C10g *1/00*
U.S. Cl. 208—8 **18 Claims**

1. A process for preparing deashed solid and liquid hydroocarbonaceous fuel from hydrocarbonaceous feed coal containing ash comprising contacting the feed coal with hydrogen and a solvent for the hydrocarbonaceous material in the coal to form a coal-solvent slurry in contact with hydrogen, passing the slurry and hydrogen through a preheater for a residence time between 0.01 and 0.25 hours, said preheater having a length to diameter ratio of at least 100 to inhibit backmixing so that an increment of said slurry gradually increases in temperature in passage through the preheater from a low inlet temperature to a maximum temperature at the preheater outlet, the maximum temperature at the preheater outlet being 400° to 525°C., the viscosity of an increment of the slurry in passage through the preheater increasing initially to a value at least 20 times the viscosity of the solvent alone when each is measured at a temperature of 99°C., the viscosity of the slurry when measured at 99°C. subsequently dropping to a value lower than 10 times the viscosity of the solvent alone when each is mesured at 99°C. in continued passage through the preheater, the viscosity of said slurry finally tending to increase to a value greater than 10 times that of the solvent alone when each is measured at 99°C. at the exit temperature of said preheater but the slurry and hydrogen being removed from said preheater after the relative viscosity drops to a value below 10 but before the relative viscosity finally increases to a value of 10, passing the slurry to a dissolver maintained at a temperature between 350° and 475°F. and which is below the temperature at the outlet of the preheater, the residence time of the slurry in the dissolver being greater than in the preheater, selectively retaining in the dissolver a portion of the ash removed from the coal relative to flow of fuel through the dissolver, removing dissolver effluent and separating said effluent into a gaseous stream, a fraction which is liquid at room temperature and a deashed fraction which is solid at room temperature, recycling hydrogen contained in said gaseous stream to the preheater, and recycling at least a portion of said liquid and/or solid fraction as solvent for said preheater step.

3,884,797
HYDROFINING-REFORMING PROCESS

Starling K. Alley, Jr., Brea, and Edward C. Attane, Jr., Orange, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 183,793, Sept. 27, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,931
Int. Cl. C10g *23/04, 31/14*
U.S. Cl. 208—89 **12 Claims**



6. A process for the hydrodesulfurization and reforming of a sulfur-containing naphtha feedstock, at least a portion of the sulfur in said feedstock appearing in compounds comprising a thiophene ring, which comprises:

1. contacting said feedstock plus added hydrogen with a sulfided Group VIB and Group VIII mixed-metal hydrofining catalyst under hydrofining conditions adjusted to reduce the organic sulfur content of said feedstock to between about 0.5 and 10 ppm;
2. separating hydrogen sulfide from the resulting intermediate gasoline product;
3. contacting said intermediate gasoline product plus added hydrogen with a hydrogen-reduced, initially substantially sulfur-free molybdenum and Group VIII mixed-metal hydrofining catalyst under hydrofining-sorption conditions adjusted to effect a further substantial reduction in the organic sulfur content thereof, to a level below about 2 ppm, and also to sorb substantially all of the hydrogen sulfide thereby generated on said hydrogen-reduced hydrofining catalyst, said hydrofining-sorption conditions including a temperature above about 575°F; and
4. subjecting total effluent from step (3) to catalytic reforming in contact with a sulfur-sensitive Group VIII noble metal reforming catalyst.

3,884,798
HYDROCRACKING PROCESS USING CO-EXTRUDED NICKEL-ON-SILICA-ALUMINA

Lee Hilfman, Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 228,825, Feb. 24, 1972, abandoned. This application Mar. 12, 1973, Ser. No. 340,423
Int. Cl. C10g *13/06, 31/14*
U.S. Cl. 208—111 **3 Claims**

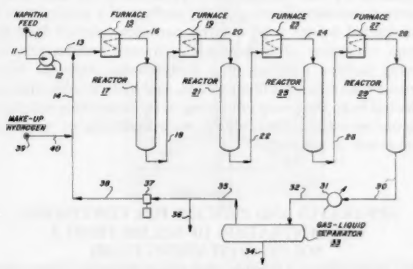
1. A process for hydrocracking a hydrocarbonaceous charge stock which comprises reacting said charge stock with hydrogen in contact with a catalytic composite of coextruded particles of a carrier material consisting essentially of a silica-

alumina amorphous refractory inorganic oxide in which the silica is present in an amount of from about 10.0 to about 90.0% by weight and from about 6.5 to about 10.5% by weight of a nickel component, calculated as the elemental metal, said particles being prepared by coextruding a mulled acidic admixture of a powdered preformed carrier material consisting essentially of a silica-alumina amorphous refractory inorganic oxide and a powdered nickel salt, said coextruded particles being calcined at a temperature above about 1200° F., reduced, and sulfided prior to contact thereof with said hydrocarbonaceous charge stock; said reaction conditions including a maximum catalyst bed temperature of about 600° to about 900° F., a pressure of about 500 psig. to about 5000 psig., a liquid hourly space velocity of about 0.1 hr. $^{-1}$ to about 10 hr. $^{-1}$ and a hydrogen concentration in the range of about 1000 to about 50,000 scf./Bbl.

3,884,799
REFORMING WITH PLATINUM-RHENIUM-SELENIUM CATALYSTS

John A. Mahoney, Park Forest South, Ill., and Albert L. Hensley, Jr., Munster, Ind., assignors to Standard Oil Company, Chicago, Ill.

Filed Dec. 11, 1972, Ser. No. 314,133
Int. Cl. C10g *35/08*
U.S. Cl. 208—139 **8 Claims**



1. A process for the reforming of a petroleum hydrocarbon fraction, which process comprises contacting said hydrocarbon fraction in a reforming zone under reforming conditions and in the presence of hydrogen with a catalytic composition consisting essentially of about 0.1 to about 5 weight percent Group VIII noble metal, about 0.1 to about 5 weight percent rhenium, and at least 0.005 weight percent selenium deposited on a solid catalytic support comprising a refractory inorganic oxide.

3,884,800
AUTOMATIC SORTING AUGER CONVEYER

Wendell R. Helmolt, Sr., Windsor, Conn., assignor to Polymer Machinery Corporation, Berlin, Conn.

Filed Aug. 16, 1974, Ser. No. 498,133
Int. Cl. B07b *13/04*
U.S. Cl. 209—82 **8 Claims**

1. For use with a grinder for the plastic waste runners resulting from a multi-cavity injection molding process, a sorting-conveyor for automatically sorting the molded parts from the runners and for conveying the runners to the grinder, comprising in combination:

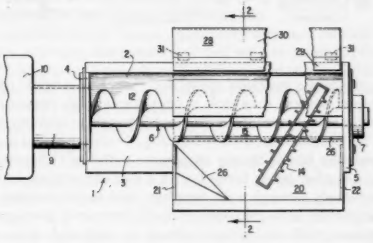
an elongated trough having opposed end walls one of which is provided with a circular opening and is connectable to the grinder, and first and second side walls with at least said first side wall being inclined and sloping downwardly and inwardly;

an auger disposed in the bottom of said trough and having one end thereof extending through said opening, the pitch of the auger helix being less than the length of the runners and greater than the length of the molded parts to be separated;

means for rotatably mounting the opposite end of said auger in the other of said end walls;

an elongated opening of a width sufficient to pass the molded parts in the bottom of said trough beneath said auger and extending from said other end wall along a substantial portion of the length of said auger;

a plate fastened to said second side wall of said trough and extending laterally therefrom so as to cover at least one-half of said auger, the clearance between said plate and said auger being substantially less than the thickness of a runner; and



means fastened to said first side wall below the locus of the longitudinal axis of said auger and extending along the entire length of said opening for preventing any runners from sliding along said first side wall and through said opening, whereby when the auger is rotated in a direction toward the edge of said plate, the molded parts supplied to said trough will fall through the auger helix and out the bottom opening in the trough while the runners supplied to said trough will be carried along by the auger toward the end wall which is fastened to the grinder.

3,884,801
PREPARATION OF REVERSE OSMOSIS MEMBRANES BY COMPLETE EVAPORATION OF THE SOLVENT SYSTEM

Robert Emil Kesting, Mount Baldy, Calif., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 249,571, May 2, 1972, abandoned. This application Sept. 26, 1973, Ser. No. 401,003
Int. Cl. B01d *13/00*
U.S. Cl. 210—23 **8 Claims**

1. A process for forming an asymmetric reverse osmosis membrane consisting essentially of the steps:

a. preparing a dilute solution consisting of a cellulose ester in an amount less than or equal to 15 percent by weight of the solution, a solvent for the cellulose ester consisting of acetone or dioxane, and at least one pore-forming material,

the solvent having a boiling point at least 30°C lower than the boiling point of the pore-forming material and the pore-forming material being a nonsolvent for the cellulose ester,

b. casting said dilute solution to form a thin film, and

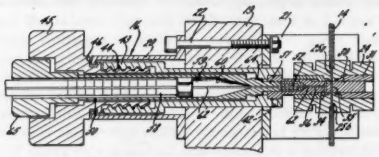
c. allowing the solvent and pore-forming material to evaporate completely.

3,884,802

LIQUID CHROMATOGRAPHY INJECTION SYSTEM

Johannes Spaans, Schipluiden, and Adrianus Onderwater, Delft, both of Netherlands, assignors to Packard Becker BV, Netherlands

Filed Oct. 5, 1973, Ser. No. 403,791
Int. Cl. B01d *15/08*
U.S. Cl. 210—31 C 12 Claims



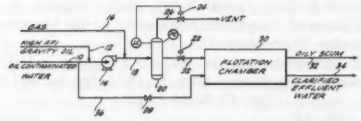
1. A sample injection apparatus for use in a liquid chromatography system in which a continuous high pressure, high velocity solvent stream is directed through a column comprising, in combination, a valve housing, a valve member mounted for relative lateral sliding movement within said housing, said valve member being formed with a pair of passages extending transversely through said member, said valve member being positionable such that one of said transverse passages is in alignment with said solvent stream so that said stream flows through said one passage, a sample holding means for selectively drawing in and ejecting variable quantities of a sample, said sample holding means having an outlet at one end thereof and being removably positionable within said valve member such that said outlet is disposed at the other of said transverse valve passages, and means for laterally moving said valve member with said sample holding means positioned therein from a position where said one valve passage is aligned with said solvent stream to a position where said other valve passage is aligned with said solvent stream and said solvent flows through said other passage.

3,884,803

PROCESS FOR SEPARATING LOW API GRAVITY OIL FROM WATER

Verlon L. Traylor, Casper, Wyo., assignor to Union Oil Company of California, Brea, Calif.

Filed June 23, 1972, Ser. No. 265,649
Int. Cl. B01d *17/02*
U.S. Cl. 210—44 11 Claims



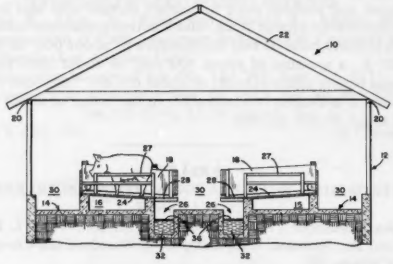
1. In a process for treating water contaminated with low API gravity oil to remove the oil contaminent therefrom wherein said contaminated water is contacted with finely divided gas bubbles in a flotation chamber to float the oil to the surface of said water, oil is mechanically removed from the surface of said water and water having reduced oil contamination is withdrawn from said flotation chamber, the improvement which comprises adding to said contaminated water prior to its introduction into said flotation chamber about 1 to 10 volumes of a high API gravity crude petroleum per volume of said low API gravity oil, said high API gravity crude petroleum having an API gravity above about 35°.

3,884,804

METHOD OF DEODORIZING ANIMAL WASTES

James V. Robinson, Chillicothe, and Larry O. Hill, Frankfort, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed June 29, 1973, Ser. No. 375,076
Int. Cl. C02b *3/06*
U.S. Cl. 210—64 13 Claims



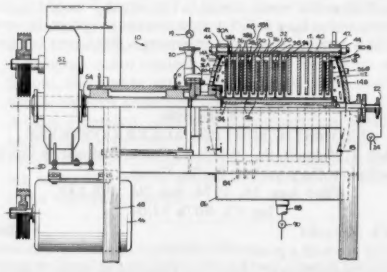
1. A method of treating animal wastes to reduce the odors produced by the degenerative breakdown of said animal wastes comprising floating on the surface of a watery mass of said animal wastes solid catalyst particles selected from the group consisting of carbon and activated carbon particles having surface portions of a hydrophobic material which forms a discontinuous film thereon, said hydrophobic material selected from the group consisting of polytetrafluoroethylene, silicone resins and silica colloids made hydrophobic by surface conversion to silicone.

3,884,805

APPARATUS AND PROCESS FOR CONTINUOUS CONCENTRATION OF SOLIDS FROM A SOLIDS-CONTAINING FLUID

Alex Bagdasarian, Arlington, and James Donovan, Cambridge, both of Mass., assignors to Artisan Industries Inc., Waltham, Mass.

Filed May 13, 1974, Ser. No. 469,628
Int. Cl. B01d *37/02*
U.S. Cl. 210—65 24 Claims



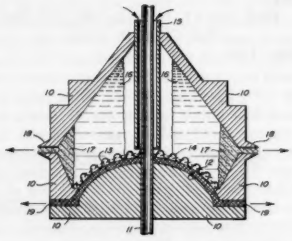
18. A process for separating a concentrated slurry and a filtrate from a solids-containing fluid, said process comprising the steps of (1) introducing a solids-containing fluid into one end of a housing characterized by said one end and another, opposite end and containing (i) at least one filter means comprising a filter chamber having at least one filtering surface, the interior of said chamber being in fluid communication with the exterior of said housing and said filtering surface being disposed in a path whereby fluid may flow through said housing, and (ii) a rotor means including an edged blade

disposed to be rotated with its edge turning substantially parallel with and in spaced relation to said filtering surface; (2) flowing said solids-containing fluid under pressure through said housing past and against said filtering surface and thereby and thereat effecting a separation of said fluid into a concentrated slurry flowing past said filtering means and a filtrate entering said filter chamber; (3) discharging the concentrated slurry from said other, opposite end of said housing and the filtrate from said filter chamber; (4) simultaneously with the effecting of said separation forming a filter cake layer on said filtering surface of solids deposited thereon from said solids-containing fluid, and (5) then and thereafter maintaining said filter cake layer at a predetermined thickness by rotation of the blade of said rotor means across that layer.

3,884,806
METHOD AND APPARATUS FOR CENTRIFUGALLY REGENERATIVE FILTRATION

Robert W. Coughlin, Bethlehem, Pa., and Joseph R. Polek, Baltimore, Md., assignors to Robert W. Coughlin, Bethlehem, Pa.

Filed Dec. 26, 1972, Ser. No. 318,266
Int. Cl. B01d *33/04*
U.S. Cl. 210—78 **10 Claims**



1. A method of separating particles from a mixture thereof with fluid which comprises:

a. introducing said mixture into a rotatable container having an internal wall disposed oppositely from the axis of rotation of said container and adapted to collect dense particulate portions of said material-to-be-filtered, said container also having therein a porous filtration surface disposed at an angle with respect to said internal wall,

b. causing fluid to pass through said porous filtration surface thereby filtering said particles from said mixture,

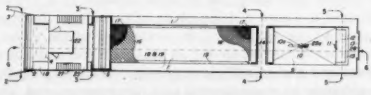
c. rotating said container thereby causing said filtered particles to be removed from said filtration surface toward said inner wall of said container by centrifugal action,

d. recovering the filtered fluid thereby produced.

3,884,807
APPARATUS FOR SKIMMING IN MULTI-PHASE FLUID MEDIA

Merlyn W. Heddon, 8912 Victoria Ave., South Gate, Calif. 90280

Continuation-in-part of Ser. No. 29,783, April 20, 1970, abandoned. This application Oct. 18, 1971, Ser. No. 190,082
Int. Cl. E02b *15/04*
U.S. Cl. 210—104 **1 Claim**



1. A system for separation of the upper phase from the lower phase of a two-phase fluid medium, said system comprising:

a towable skimming vessel having an inlet lip, a collection chamber adjoining said lip, a settling chamber adjoining said collection chamber, and a separation and storage chamber adjoining said settling chamber, said lip being adjustable to be positioned in the two phase fluid medium so as to substantially separate the upper phase from the lower phase thereof and to direct said upper phase fluid into said collection chamber;

a paddle means and a baffle means disposed at the end of said collection chamber, adjoining said lip, and positioned so as to further separate said upper phase fluid from said lower phase fluid and to further urge a substantial portion of said upper phase fluid over said baffle means into said settling chamber;

an adjustable weir positioned in said vessel so as to form a common barrier between said settling chamber and said separation and storage chamber; and

automatic control means operatively disposed on said weir for adjusting the position of said weir to permit optimum flow of said upper phase fluid from said settling chamber into said separation and storage chamber, said automatic control means comprising:

a motor for moving the weir;

a source of power;

first electrode means including a pair of electrodes positioned on said weir, one higher than the other, and arranged to connect said motor to said source of power when said first electrode means is positioned above or below the interface between the upper and lower phase of said fluid medium in said settling chamber to lower or raise said weir, and arranged to disconnect said motor from said source of power when one of said electrodes in said electrode pair is above and the other electrode of said electrode pair is below said interface;

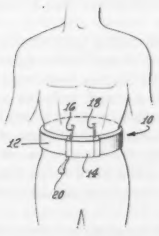
a pump having an outlet, said pump being positioned in the lower portion of said separation and storage chamber, and a motor for exciting said pump; and

a second electrode means in the lower portion of said separation and storage chamber positioned to operate said pump motor so long as said second electrode means is in the lower phase of said fluid medium in said separation and storage chamber.

3,884,808
WEARABLE, SELF-REGENERATING DIALYSIS APPLIANCE

Robert D. Scott, Covina, Calif., assignor to Research Development Systems, Inc., Pasadena, Calif.

Filed June 20, 1973, Ser. No. 371,950
Int. Cl. B01d *31/00*
U.S. Cl. 210—109 **9 Claims**



1. In a dialyzing appliance of the type adapted to be worn about the human body for continuous use as the user goes about his daily tasks which comprises a dialyzing means including a dialysis fluid chamber and dialysis membrane defining an extended blood flow passage for blood circulation

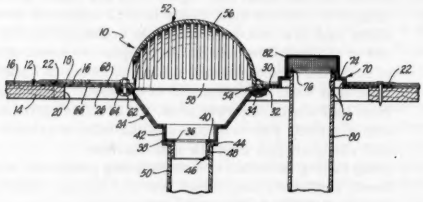
through the fluid chamber in dialyzing relation with the dialysis fluid, means to regenerate the dialysis fluid continuously during blood circulation comprising a regeneration loop having in series flow connection with the dialysis fluid chamber a first regeneration chamber containing sorbtive material adapted to remove from the dialyzing fluid impurities dialyzed thereinto from the blood, and a second regeneration chamber containing particulate make-up dialyzate solids adapted for controlled rate dissolution by dialyzing fluid passing through said second chamber for reconstituting the dialysis fluid, and means to pump the dialysis fluid continuously through the regeneration loop in solid dialyzate dissolving relation; and means to removably attach the appliance to the body of the wearer comprising a belt adapted to encircle the waist of the wearer and having a buckle portion for securing the belt in position; said pump means including an electrically operated motor carried by the belt and buckle to drive the pump.

3,884,809

SCUPPER DRAIN STRUCTURE

Duane D. Logsdon, 1719 Canyon Rd., Fullerton, Calif. 92631

Filed June 28, 1973, Ser. No. 374,752
Int. Cl. E03t *5/06*
U.S. Cl. 210—163 **1 Claim**



1. A scupper drain structure which comprises:

a body of a laminated material having a peripheral section and an integral central section which is completely surrounded by said peripheral section,

said peripheral section having a top and bottom and being nearly flat and sloping downwardly from its periphery towards said central section,

said central section having a top and a bottom and having a generally funnel like shape, said central section extending beneath said bottom of said peripheral section,

said central section including a peripheral, internal groove extending completely around the interior of said central section located at the top thereof immediately below the adjacent, surrounding surface of said top of said peripheral section,

said central section also including a bottom discharge opening,

said body and said central section consisting of an imporous, continuous, lower, self-supporting layer of ABS polymer material and an imporous, continuous upper surface layer of an acrylic polymer material, said surface layer being thermally bonded to said lower layer,

fitting means for securing the bottom of said central section to a pipe located on the exterior of the bottom of said central section so that such a pipe may be attached to said central section in communication with said discharge opening,

said fitting means including at least two stepped shoulders of different outer diameters corresponding to the internal diameters of different standard pipes,

a self-supporting screen means having a peripheral mounting flange and a central foraminous structure completely surrounded by said mounting flange and extending upwardly from the top of said mounting flange,

said screen means being located with said mounting flange fitting within said groove so as to support said screen means on said body,

said screen means including an imperforate guard wall extending around said foraminous structure adjacent to said flange, said guard wall serving to prevent roof debris from entering said central section of said body,

said mounting flange being no thicker than the depth of said groove beneath said surface of said top of said peripheral section adjacent to said screen means on said body with said mounting flange within said groove, said fastening means extending between said body and said screen means,

overflow means located on said peripheral section adjacent to said central section, said overflow means internally spaced from the periphery of said peripheral section,

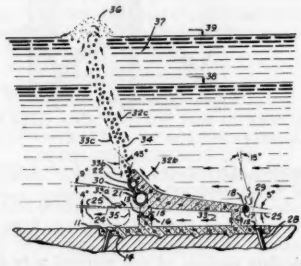
said overflow means consisting of an upstanding hollow boss having an open top extending upwardly from said top of said peripheral section, said boss having internal stepped shoulders of different internal diameters corresponding to the outer diameters of different standard pipes.

3,884,810

ANTI POLLUTION WATERWAY DEVICE AND PROCESS

Wassily Smyrnow, 2813 Arlington Blvd. Apt. 102, Arlington, Va. 22201

Filed July 13, 1972, Ser. No. 271,244
Int. Cl. E02b *15/04*
U.S. Cl. 210—170 **8 Claims**



1. An improved anti-pollution system for a waterway having a normal direction of flow and carrying a certain amount of pollutants in said flow comprising in combination:

a rigid, elongated member having a weight substantially greater than the water it displaced disposed across the bottom of said waterway,

a conduit carried by said member along its longitudinal length,

mounting means to securely affix said member to said bottom surface at an angle from about 15° to 75° to said direction of flow,

a plurality of air escapement perforations spaced along the length of said conduit,

said member having an upper surface having an upstream edge and a downstream edge and said upper surface angles upwardly from said upstream edge to said downstream edge so as to deflect water moving in said normal direction of flow in an upward direction,

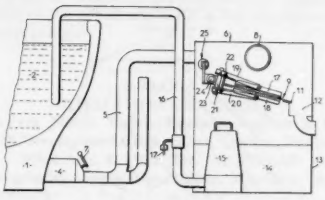
pump means providing air to said conduit at a pressure sufficient to cause a rising plane of turbulence from said conduit to the surface of the waterway where a line of turbulence is formed having an upstream end and a downstream end and of sufficient pressure to cause pollutants in said flow to move toward said downstream end, and

means for collecting said pollutants at said downstream end.

3,884,811
FILTER

George Anthony Chattaway, Meriden, and Arthur James Pearson-Coleman, Warwick, both of England, assignors to Vortex (Fishery Equipment) Ltd., England

Continuation of Ser. No. 324,952, Jan. 19, 1973, abandoned. This application June 25, 1974, Ser. No. 482,931
Int. Cl. E04h 3/20
U.S. Cl. 210—169 4 Claims

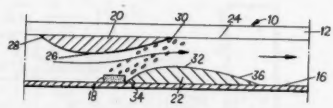


1. Apparatus for removing solid materials from the liquid of a fish tank comprising a filter housing, an inclined liquid permeable screen means fixed within said housing and having upper and lower surfaces, means for removing liquid from said fish tank and discharging the liquid onto the upper surface of said inclined screen means so that a major portion of the liquid filters through said screen means and a lesser portion of the liquid flushes solid materials down the inclined upper surface of said screen means, means for receiving said lesser portion of liquid and solid materials and discharging the same from said housing, carrier means located within said housing adjacent to said screen means, a first brush means pivotally mounted on said carrier means for engaging the upper surface of said screen means, a second brush means pivotally mounted on said carrier means for engaging the lower surface of said screen means and substantially beneath said first brush means, means for moving said carrier means and said first and second brush means along said screen means in a direction transverse to the slope of the screen means adjusting means interconnecting said first and second brush means for adjusting the pressure of said first and second brush means relative to the upper and lower surfaces of said screen means so that the pressure applied to the screen means by both brush means is substantially the same, receiver means located below said screen means for receiving filtered liquid passing therethrough, and means for returning the filtered liquid from said receiver means to said fish tank.

3,884,812
LIQUID TREATMENT APPARATUS

Hans Lindquist, Rotterdam, Netherlands, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 13, 1973, Ser. No. 426,951
Int. Cl. C02c 1/12
U.S. Cl. 210—220 2 Claims



1. An apparatus for circulating and aerating a body of water containing waste sludge comprising:

a continuous channel having a bottom and a pair of side walls;

upper and lower generally airfoil-shaped planes substantially horizontally disposed within said channel perpendicular to said side walls, each of said planes having a leading edge and a trailing edge with a camber therebetween;

said upper plane being disposed above said channel bottom and said lower plane being disposed adjacent to said channel bottom, with the cambers of said planes facing one another;

the trailing edge of said lower plane being disposed in front of the trailing edge of said upper plane and below the forward portion of said upper plane;

means for introducing air into said channel immediately adjacent to said lower plane trailing edge;

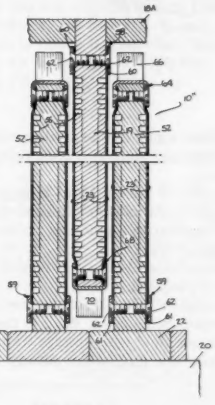
the height of each said plane being within the range of about 1/4 and 3/4 of the distance between said bottom of said channel and the top of said upper plane; and

the length of each said plane being from about 4 to 20 times greater than the height thereof.

3,884,813
SOLIDS CONCENTRATOR WITH A ROTOR HAVING PLOUGHS THEREON

James Donovan, Cambridge, and Alex Bagdasarian, Arlington, both of Mass., assignors to Artisan Industries Inc., Waltham, Mass.

Filed May 13, 1974, Ser. No. 469,627
Int. Cl. B01d 33/00
U.S. Cl. 210—297 10 Claims



1. A dynamic concentrator for separating a filtrate and a concentrated slurry from a solids-containing fluid, said concentrator comprising (1) a housing characterized by a longitudinal axis and having an inlet for introducing a solids-containing fluid into said housing and an outlet for removing a concentrated slurry of solids therefrom; (2) at least two substantially parallel, coaxially spaced apart and relatively stationary filter means mounted within said housing between said inlet and said outlet, said filter means each comprising a filter chamber having at least one filtering surface with the interior of each filter chamber being in fluid communication with the exterior of said housing for the removal of filtrate from those chambers and filtering surfaces on said two filter means being in facing relation one to the other from filter means to filter means; (3) a rotor shaft extending coaxially through said housing and disposed to have a motor means connected thereto for imposing rotation thereon; (4) a rotor disc mounted to said rotor shaft to be rotated therewith coaxially with said filter means and located between opposite, facing filtering surfaces thereof to thereby provide a flow path for solids-containing fluid from said inlet to said outlet which extends across said filtering surfaces and from one side of said disc to the opposite side thereof passing around the peripheral outer edge of said disc between that edge and the interior

surface of said housing, and (5) at least one plough member extending outwardly from the peripheral, outer edge of said rotor disc into said flow path to deter accumulation of solids between said two filter means in the region defined radially between the interior surface of said housing and said outer edge of said rotor disc as said rotor shaft and disc are rotated and said plough member is rotated therewith.

3,884,814

APPARATUS FOR FRACTIONATING FLUIDS

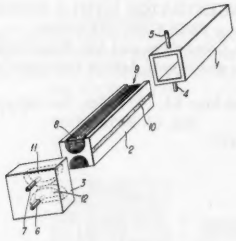
Bernard Vogt, and Michel Rochet, both of Rhone, France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed July 23, 1973, Ser. No. 381,427

Claims priority, application France, July 26, 1972, 72.26956; May 4, 1973, 73.16147

Int. Cl. B01d *31/00*

U.S. Cl. 210—321 **29 Claims**



1. Apparatus which can be used especially for fractionating fluid mixtures, said apparatus comprising, in combination:

a. a jacket;

b. a plurality of hollow fibres arranged in the shape of at least one U and positioned within the jacket;

c. a core supporting the hollow fibres and placed inside the branches of the U;

d. means defining at least one groove in which said hollow fibres are located;

e. means for fixing the fibres to one another at their ends, said means being firmly fixed to the core;

f. at least one fluid inlet passage formed in the jacket; and

g. at least one fluid outlet passage formed in the jacket.

3,884,815

OIL INTERCEPTORS FOR SEPARATING OIL FROM WATER BY GRAVITY

Jan Cornelissen, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

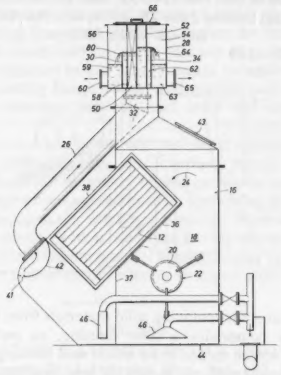
Filed Oct. 26, 1973, Ser. No. 410,279

Claims priority, application United Kingdom, Oct. 27, 1972, 49593/72; July, 1973, 34471/73

Int. Cl. B01d *21/00*

U.S. Cl. 210—521 **7 Claims**

1. Oil interceptor for separating oil from water by gravity comprising a closed interceptor vessel having an oil/water inlet, an overflow container mounted above said interceptor vessel, said overflow container having a cross-sectional area less than one-half that of said interceptor vessel, a dividing wall mounted in the overflow container dividing the interior thereof into an oil overflow compartment and a water overflow compartment, each of said compartments having an fluid inlet port and a fluid outlet port, an oil conduit operatively connecting one side of the interceptor vessel with the inlet port of the oil overflow compartment of said overflow container, a water conduit operatively connecting the other side of said interceptor vessel with the inlet port of the water overflow compartment of said overflow container, separate oil outlet wnd water outlet weirs mounted in said oil and said water overflow compartments of said overflow container and being connected respectively in fluid communication to said oil outlet port and said water outlet port of the overflow container of said interceptor vessel, the oil outlet weir and the water outlet weir being mounted closely adjacent to one another and at a position above the interceptor vessel, the edge of the oil weir being at a higher level than the edge of the water weir, and at least one of the weirs being of a curved configuration at its upper edge between the ends thereof.



3,884,816

METHOD AND APPARATUS FOR DETECTING DANGEROUS ARTICLES AND/OR PRECIOUS METALS

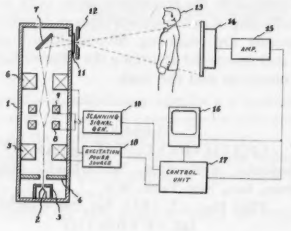
Kanjiro Takahashi, Tokyo, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

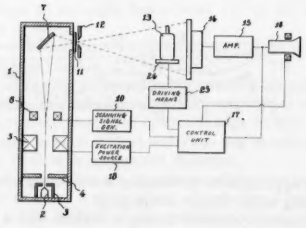
Filed Dec. 12, 1973, Ser. No. 426,638

Claims priority, application Japan, Dec. 19, 1972, 47-127365; Dec. 27, 1972, 48-2158

Int. Cl. G01n *23/04, 23/08, 23/10*

U.S. Cl. 250—359 **12 Claims**

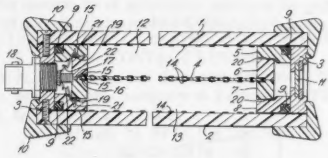




1. A method for searching objects for metallic articles such as weapons or contraband comprising the steps for:

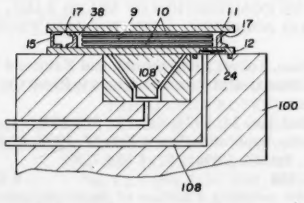
a. generating and accelerating an electron beam,
b. irradiating said electron beam on a target,
c. irradiating an object to be searched with an X-ray obtained by scanning said electron beam in coarse steps on said target,
d. detecting the X-ray transmitted to said object,
e. surveying the portion of the object where the X-ray absorption is comparatively high by means of said detected signal, and
f. obtaining a detailed X-ray transmission image of said portion of the object where the X-ray absorption is comparatively high.

3,884,817
IONIZATION CHAMBER
Phillip Harvey Jilbert, Tadley, England, assignor to National Research Development Corporation, London, England
Filed Aug. 1, 1972, Ser. No. 277,042
Claims priority, application United Kingdom, Aug. 11, 1971, 37799/71
Int. Cl. G01t *1/00*
U.S. Cl. 250—385 **5 Claims**



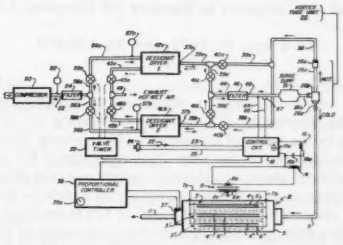
1. An ionisation chamber comprising housing means enclosing and defining an active volume, said housing means including walls having inner surfaces contacting the active volume, said walls comprising spaced apart circular discs formed of an insulating material having a mean atomic number approximating that of air, said circular discs having an electrically conducting material of an atomic number different from said mean atomic number approximating that of air formed on the inner surface thereof, said electrically conducting material being arranged on said circular discs inner surfaces as a pattern of lines in order to occupy only a small proportion of the area of said wall surfaces whereby the effect of the thickness of said electrically conducting material on the sensitivity of the ionisation chamber is minimized.

3,884,818
FILM CASSETTE FOR RADIOGRAPHIC APPARATUS
Chuji Tomita; Kouichi Shimizu, both of Tokyo; Shizuo Shima, and Tatsuhiro Ishizuka, both of Chiba, all of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan
Filed Sept. 17, 1973, Ser. No. 397,815
Int. Cl. G03b *41/16*
U.S. Cl. 250—480 **8 Claims**



1. A cassette for use in radiographic apparatus, comprising: an upper lid and a lower lid, both comprised of a quadrilateral thin plate and having flat surfaces, said lower lid having an aperture extending therethrough;
a packing having a base portion fixed to said a flat surface of said lower lid, a projection extending from said base portion and a flexible lip having an upper portion overlaying a lower portion thereof and extending beyond said projection, a space being defined by said flat surfaces of the upper and lowerlids and also by said packing for containing a film and intensifying screens, said lower lid defining a passageway between said aperture and said space; and
valve means positioned within said aperture for selectively sealing said space from the external atmosphere and allowing the space to communicate with the external atmosphere, said valve means comprised of a valve seat, said valve seat defining lower and upper chambers in said aperture, a valve body positioned in said lower chamber, a shaft coupled to said valve body and upwardly extending therefrom into the upper chamber, a push button coupled to said shaft and housed in the upper chamber, and a coil spring disposed between said push button and said valve seat, said coil spring biasing said valve body against said valve seat.

3,884,819
GAS COOLING AND DRYING SYSTEM FOR CORONA DISCHARGE OZONE GENERATING UNIT
Ronald A. Schultz, Berkeley, and Robert I. Tenney, Deerfield, both of Ill., assignors to Ozone Incorporated, Deerfield, Ill.
Filed Aug. 19, 1974, Ser. No. 498,845
Int. Cl. C01b *13/12*; **F25b** *9/02*
U.S. Cl. 250—533 **7 Claims**



1. In combination, a corona discharge ozone generating unit; means for cooling the corona discharge ozone generating unit comprising a vortex tube unit for receiving gas to be ozonized at a first inlet and separating the high energy gas molecules from the low energy gas molecules therein and delivering the resultant relatively cool gas molecules to a cool gas outlet therof and the relatively warm gas molecules to a warm gas outlet thereof; a main inlet for an oxygen containing gas to be ozonized; a drying unit providing for the flow in one direction or the other therethrough of gas to be dried and ozonized and including means for absorbing moisture from the gas flowing therethrough which must be periodically dried with warm gas, said gas drying unit having a first inlet at one end into which oxygen containing gas to be dried is to pass into the unit, an outlet for a de-moisturizing gas from which outlet drying gas passes from the unit, and an opening from whcih dried oxygen containing gas can exit from the unit or drying warm gas can enter the unit; conduit means forming a first passageway interconnecting said main inlet and said first inlet of said drying unit; valve means in said first passageway for selectively opening and closing said first passageway; conduit means forming a second passageway extending between said outlet for de-moisturizing gas of said drying unit and a discharge point therefor; second valve means for said second passageway for selectively opening or closing the same; conduit means forming a third passageway extending between

said opening in said drying unit from which dried oxygen containing gas can exit and said inlet of said vortex tube unit; third valve means for said third passageways for closing off the associated passageway leading to said inlet of said vortex tube unit when the opening of the associated drying unit acts as an entryway for de-moisturizing gas and for opening the same when the opening of the associated drying unit is to act as an exitway for dried oxygen containing gas; conduit means forming a fourth passageway extending from the warm air outlet of said vortex tube unit to a point of said third passageway on the side of said third valve means nearest said opening in said drying unit; foruth valve means for said fourth passageway for closing off the associated passageway when the opening in hte associated drying unit is to act as an exitway for dried gas to be ozonized and for opening the associated passageway when the opening of said drying unit acts as an entryway for de-moisturizing gas; and conduit means extending between the cool gas outlet of said vortex tube unit and the inlet to said ozone generating unit for feeding sufficient quantities of cold gas through said ozone generating unit to generate the required amount of ozone and to cool the surfaces within said ozone generating unit so that the temperature of the ozone produced does not reach an elevated temperature at which ozone substantially dissociates.

3,884,820

GREASE COMPOSITION

James E. Miller, Griffith, and Reuben A. Swenson, Whiting, both of Ind., assignors to Standard Oil Company, Chicago, Ill.

Filed Apr. 19, 1971, Ser. No. 135,473
Int. Cl. C10m *5/14, 5/10*
U.S. Cl. 252—41 **10 Claims**

1. A grease resistant to separation by centrifugal force consisting essentially of a mineral lubricating oil having a viscosity in the range of from about 130 to about 200 SSU at 210°F containing as the sole thickening agent for said oil either (a) from about 6 to about 10 weight per cent of polyethylene having a number average molecular weight in the range of from about 1,500 to about 3,000 or (b) from about 6.5 to about 12 weight per cent of a mixture consisting of (i) from about 6 to about 10 weight per cent of polyethylene having a number average molecular weight in the range of from about 1,500 to about 3,000 and (ii) from about 0.5 to about 2 weight per cent of a lithium higher fatty acid soap.

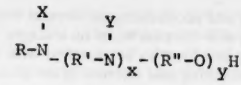
3,884,821

POLYBUTENYL-ALKYLENE POLYAMINE-POLYALKANOL LUBRICANT ADDITIVE AND LUBRICATING COMPOSITIONS CONTAINING SAME

Edward F. Miller, Wappingers Falls, and Walter W. Hellmuth, Hopwell Junction, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 155,286, June 21, 1971, abandoned. This application Oct. 19, 1973, Ser. No. 408,226
Int. Cl. C10m *1/32*
U.S. Cl. 252—51.5 R **7 Claims**

1. A lubricating oil composition comprising a major amount of a mineral lubricating oil and a dispersant amount of an oil-soluble ashless polybutenyl-alkylene polyamine-alkanol having the structural formula:



in which R is a polybutenyl radical having a molecular weight from 900 to 10,000, X and Y are H or $(R''—O)_y—H$ at least one of X or Y being $(R''—O)_y—H$, R' is a divalent hydrocarbyl radical having from 2 to 8 carbon atoms, R'' is a divalent hydrocarbyl radical having from 2 to 4 carbon atoms, x has a value from 1 to 6 and y has a value from 1 to 5.

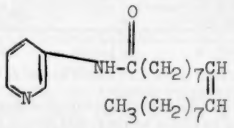
3,884,822

LUBRICANT COMPOSITION CONTAINING 3-AMIDOPYRIDINE CORROSION INHIBITOR

Robert M. Gemmill, Jr., Pitman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed July 6, 1973, Ser. No. 377,002
Int. Cl. C10m *1/32*
U.S. Cl. 252—51.5 A **7 Claims**

1. A lubricant composition comprising a major amount of a lubricating oil or grease containing, in an amount sufficient to inhibit metal corrosion, a 3-amidopyridine having the structure:



3,884,823

CERAMIC PERMANENT MAGNET

Ronald L. Clendenen, Orinda; Eugene E. Olson, Oakland, and Charles M. Schlaudt, Berkeley, all of Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Sept. 27, 1971, Ser. No. 183,896
Int. Cl. C04b *35/00*
U.S. Cl. 252—62.63 **3 Claims**

1. A permanent ceramic magnet having a normal coercive force of not less than 3600 oersteds and a remanence of not less than 3600 gauss consisting essentially of a magnetoplumbite of the formula $MO.nFe_2O_3$ wherein M is strontium and n has a value of from 3 to 6.5; and having a density of not less than 95% of the theoretical maximum, an average grain size of less than 2.0 microns, not less than 90% of its grains less than 2.5 microns in diameter and a crystallite orientation of not less than 95%.

3,884,824

METHOD AND COMPOSITION OF MIXED $BASO_4$ AND $SRSO_4$ FOR POLISHING A PHOTOCONDUCTOR SURFACE

Kazunori Matsuo, Tokyo; Kohji Suzuki, and Katutsohi Endo, both of Yokohama, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Jan. 24, 1973, Ser. No. 326,561
Claims priority, application Japan, Feb. 17, 1972, 47-16724
Int. Cl. C09g *1/02;* **C11d** *7/50*
U.S. Cl. 252—164 **5 Claims**

1. Method for polishing a surface of photoconductor consisting essentially of amorphous selenium with polishing material, said polishing material comprising a mixture of strontium sulfate and barium sulfate.

4. Polishing materials for use with photoconductive amorphous selenium, comprising a mixture of strontium sulfate and barium sulfate in the ratio of from 15:1 to 1:15 parts by weight, the particle size of the strontium sulfate and barium sulfate being from 0.1 μ to 30 μ.

3,884,825
IMAGING COMPOSITION

Nero R. Lindblad, Palmyra; Gordon E. Johnson, Webster, and James H. Sharp, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 3, 1972, Ser. No. 277,542
Int. Cl. G03g *9/02*
U.S. Cl. 252—62.1 **13 Claims**

1. A developer composition comprising particles, said particles including finely divided discrete particles having a size of less than about 30 microns of electrostatographic electroscopic toner material and a minor proportion based upon the weight of said toner material of discrete particles having a size of from about 0.5 to about 20 microns of at least one finely divided, solid additive compound selected from the group consisting of phthalic acid, isophthalic acid, terephthalic acid, the metal and ammonium salts thereof.

3,884,826
THIXOTROPIC CLEANING AGENT FOR HARD CONTACT LENSES

Russell E. Phares, Jr., San Jose, and Rebecca F. Nite, Sunnyvale, both of Calif., assignors to Barnes-Hind Pharmaceuticals, Inc., Sunnyvale, Calif.

Filed July 20, 1973, Ser. No. 381,179
Int. Cl. C11d *3/48*
U.S. Cl. 252—106 **8 Claims**

1. An aqueous thixotropic composition for cleaning hard contact lenses consisting essentially of:

from 0.1 to 20 weight percent of an anionic or nonionic detergent;

from 0.1 to 5 weight percent and in an amount sufficient to form a gel of a thixotropic gelling agent;

from 0.001 to 1 weight percent of a sterilizing agent, and water.

3,884,827
PROCESS FOR PREPARING GUANINE

Norio Asai, Chiba, Japan, assignor to Sagami Chemical Research Center, Tokyo, Japan

Division of Ser. No. 205,764, Dec. 7, 1971, Pat. No. 3,857,842. This application May 31, 1973, Ser. No. 365,676
Claims priority, application Japan, Dec. 9, 1970, 45-108579; Dec. 9, 1970, 45-108578
Int. Cl. C07d *57/40*
U.S. Cl. 260—252 **1 Claim**

1. A process for preparing guanine which comprises the steps of hydrolyzing 4(5)-aminoimidazole-5(4)-carbonitrile with hydrochloric acid at a temperature of from 50° to 108°C to produce the corresponding 4(5)-aminoimidazole-5(4)-carboxyamide and reacting the resulting carboxyamide with guanidine at a temperature of from 80° to 170°C in the absence of a solvent.

3,884,828
PROPELLANTS AND REFRIGERANTS BASED ON TRIFLUOROPROPENE

Anthony J. Butler, Greensboro, N.C., assignor to Dow Corning Corporation, Midland, Mich.

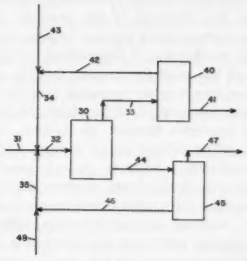
Filed Oct. 15, 1970, Ser. No. 81,123
Int. Cl. C09k *3/30, 3/06;* **F25**
U.S. Cl. 252—305 **10 Claims**

1. In an aerosol product which consists essentially of an active ingredient, a solvent and a propellant in a container, the improvement comprising employing trifluoropropene as 1 to 100 percent by weight of the propellant, the balance of the propellant being selected from the group consisting of fluorodichloromethane, difluorochloromethane, fluorotrichloromethane, difluorodichloromethane, 1,2,2-trifluoro-1,1,2-trichloroethane, 1,1,2,2-tetrafluoro-1,2-dichloroethane, 1,1,2,2,2-pentafluoro-1-chloroethane, 1,1-difluoro-1-chloroethane, 1,1-difluoroethane, octafluorocyclobutane, methylene chloride, 1,1,1-trichloroethane, tetrafluoroethylene, vinyl chloride, propane, n-butane, isobutane, ethylene, dimethyl ether, nitrogen, nitrous oxide, carbon dioxide and mixtures thereof.

3,884,829
METHODS AND COMPOSITIONS FOR REFINING BITUMINOUS FROTH RECOVERED FROM TAR SANDS

James L. Moyer, New Castle, Del., assignor to Great Canadian Oil Sands, Ltd., Toronto, Canada

Filed Nov. 14, 1972, Ser. No. 306,475
Int. Cl. B01d *17/04*
U.S. Cl. 252—331 **10 Claims**



1. An improved diluent suitable for improving the processability of bituminous froth consisting of:

a. 20 to 80 percent petroleum naphtha characterized as boiling in the range of 150° to 500° F. and containing 5 to 50 percent aromatic hydrocarbons, 0 to 50 percent olefins, 50 to 95 percent saturated hydrocarbons and

b. 20 to 80 percent of a C_3 to C_7 ketone and mixtures thereof.

3. A method for upgrading emulsion containing bituminous froth containing water and mineral impurities which comprises diluting the froth with petroleum naphtha containing 10 to 50 percent by volume of a C_3 and C_7 ketone and thereafter centrifuging the diluted froth and recovering a froth product free of emulsions and substantially reduced in water and mineral matter.

3,884,830
CONTROLLED SELECTIVITY ACTIVATED CARBON

Richard John Grant, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 132,217, April 7, 1971, abandoned. This application Oct. 2, 1973, Ser. No. 402,682
Int. Cl. C01b *31/10*
U.S. Cl. 252—421 **10 Claims**

1. Method of making a molecular sieve in granular form, comprising agglomerating pulverized bituminous coal or charred naturally-occurring carbonaceous material with pitch, crushing the agglomerations thereof, activating the granular material thus obtained by treating it in a heating zone at from 300°C to 400°C for a period of at least 120 minutes with about 5 to 18 liters of air per gram of carbon, subsequently calcining it at a temperature of 850°C to 960°C for a period of 5 to 20 minutes, and recovering a granular, highly activated carbon having an iodine number of at least 450 and a carbontetrachloride number of no greater than 2.

3,884,831

CATALYST SYSTEM AND METHOD FOR IMPROVING THE LEACHING OF ELEMENTS SUCH AS COPPER FROM THEIR ORES USING THE CATALYST SYSTEM

Stanley H. Bloom, 6747 Hillwood Ln., Dallas, Tex. 75240

Continuation of Ser. No. 131,553, April 5, 1971, abandoned, which is a continuation-in-part of Ser. No. 749,564, Aug. 2, 1968, abandoned. This application Feb. 16, 1973, Ser. No. 333,321

Int. Cl. C22b *3/00*

U.S. Cl. 252—429 R 5 Claims

1. A catalyst system for addition to an aqueous mother liquor solution to improve the leaching of elements such as cobalt, nickel, zinc, copper, uranium, cadmium, tin, thorium or silver from their ores which comprises, per ton of ore and about 2200 pounds of mother liquor, a chloride ion source selected from the group consisting of ammonium chloride, hydrogen chloride, lithium chloride, potassium chloride, and sodium chloride, a nitrate ion source selected from the group consisting of ammonium nitrate, nitric acid, lithium nitrate, potassium nitrate and sodium nitrate, and an ammonium ion source selected from the group consisting of ammonium sulphate, ammonium sulfite, ammonium fluoride and ammonium bifluoride, the amounts of the chloride, nitrate and ammonium ion sources being present in amounts sufficient to provide in the mother liquor from about 0.0022 lbs. to about 200 lbs. of each ion, with the proviso that the total amount of the ammonium ions may be provided by a member selected from the group consisting of ammonium chloride, ammonium nitrate and mixtures thereof, an anionic hydrophile selected from the group consisting of sodium dodecylatedoxydibenzene disulfonate, sodium lauryl sulphate, sodium N-alkylcarboxy sulfosuccinate, sodium alkylsulfosuccinate, polyalkanolamine-fatty acid condensate, sodium alkylbiphenyl sulfonate, sodium alkylnaphthalene sulfonate and sodium dodecylbenzene sulfonate, and present in an amount of from about 0.02 lbs. to about 20 lbs., and a polar solvent present in an amount sufficient to allow dissolution therein of the components of the catalyst system.

3,884,832

ORGANOTIN CHROMATE POLYMERIZATION CATALYST

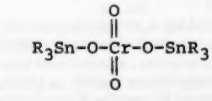
Thomas J. Pullukat, Hoffman Estates; Mitsuzo Shida, and Robert L. Gillilan, both of Barrington, all of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Filed Feb. 4, 1974, Ser. No. 439,248

Int. Cl. B01j *11/84*

U.S. Cl. 252—429 C 16 Claims

1. A catalyst system for the polymerization of at least one 1-olefin consisting essentially of a mixture of (1) a support which is a finely divided insoluble inorganic support material of the class consisting of silica, alumina, zirconia, thoria and mixtures thereof mixed with a compound of the class consisting of alkyl esters containing 1 to about 7 carbon atoms in the alkyl group and halides of titanium, zirconium, nickel and mixtures thereof in amounts to give about 0.5–10% metal on the support, and (2) an organotin chromate essentially of the formula



and (3) cocatalytic amounts of an alkyl aluminum compound of the formula R_aAlX_b in each of which formula each R is an individually selected hydrocarbon radical containing from 1 to about 14 carbon atoms, X is a member of the class consisting of halogen, hydrogen and alkoxy, *a* is an integer from 1 to 3 inclusive and *b* is an integer from 0 to 2 inclusive, with the sum of *a* and *b* being 3, the said system having an aluminum-chromium ratio of at least 2 to 1.

3,884,833

ZERO-VALENT NICKEL COMPOUND-AMINE CATALYST

Guenther Wilke, and Paul Heimbach, both of Mulheim, Ruhr, Germany, assignors to Studiengesellschaft Kohle m.b.H., Mulheim/Ruhr, Germany

Continuation of Ser. No. 816,159, April 7, 1969, abandoned, which is a continuation of Ser. No. 582,224, Sept. 27, 1966, abandoned. This application May 11, 1972, Ser. No. 252,395

Claims priority, application Germany, Sept. 28, 1965, 24437

Int. Cl. B01j *11/84*

U.S. Cl. 252—431 N 4 Claims

1. A composition comprising at least one carbonyl free zero-valent nickel complex compound having 1 to 4 electron donor constituents selected from the group consisting of compounds containing non-benzenoid carbon-carbon unsaturation, alkyl phosphites, aryl phosphites, alkyl phosphines and aryl phosphines, and morpholine or an amine of the formula

wherein R is cycloalkyl or aryl, R′ is hydrogen, alkyl, cycloalkyl or aryl or R and R′ taken together form an alkylene group which, together with said N form a closed ring, wherein said amine is present in said composition in a proportion in excess of any amine bondable to said nickel in said zero-valent complex, said composition containing free amine.

3,884,834

PROCESS CATALYST

Paul E. Eberly, Baton Rouge; Neville L. Cull, Baker, both of La.; Fred J. Buchmann, deceased, late of Baton Rouge, La., and Cordelia Atkeson Buchmann, legal representative, Baton Rouge, La., assignors to Exxon Research & Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 183,381, Sept. 24, 1971, Pat. No. 3,758,600. This application June 11, 1973, Ser. No. 368,821

Int. Cl. B01j *11/74*

U.S. Cl. 252—439 9 Claims

1. A catalyst comprising from about 0.5 to about 30 wt. %, based on total catalyst, of an oxide or sulfide or mixture thereof of chromium, said chromium being deposited upon a support consisting essentially of a mixture of from about 15 to 50 wt. % titania and at least about 20 wt. % alumina, each based upon the weight of the support.

3,884,835

CRYSTALLINE SILICA COMPOSITIONS

David E. W. Vaughan, Ellicott City, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Feb. 9, 1973, Ser. No. 331,290

Int. Cl. B01j *11/36, 11/40, 11/06*

U.S. Cl. 252—451 17 Claims

2. The method of producing a crystalline silica comprising forming an aqueous alkali silica mixture wherein the ratio of alkali oxide to silica is in the range of 0.3 up to 7, heating said mixture at about 100°C to 250°C for from about 10 up to 40 days, and recovering a crystalline silica.

5. The method as in claim 2 wherein said mixture contains a promotional metal oxide selected from the group consisting

of Group 3A metal oxides, Group 5B metal oxides, Group 6B metal oxides and mixtures thereof.

3,884,836

COMPOSITION FOR CATALYTIC DECOMPOSITION OF HYDROGEN

Dieter Kühl, Rathsberger, Germany, and Manfredo Marchetto, Viale Oleandri, Italy, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 8, 1973, Ser. No. 330,642

Claims priority, application Germany, Feb. 16, 1972, 2207281

Int. Cl. B01j *11/40*

U.S. Cl. 252—455 R 11 Claims

1. A mixed-oxide catalyst for the decomposition of hydrogen peroxide, comprising oxides of the following metals in the following metal proportions between about 20 and 30% by weight of manganese, 4 and 7% by weight of cobalt, 12 and 16% by weight of copper, 10 and 13% by weight of silver, and 40 and 50% by weight of lead.

3,884,837

CATALYST CONTAINING A PEROVSKITE-LIKE MANGANITE

Joseph Peter Remeika, Warren, and Rudolf Johannes H. Voorhoeve, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 2, 1973, Ser. No. 375,948

Int. Cl. B01j *11/06*

U.S. Cl. 252—462 6 Claims

1. Catalyst containing an active ingredient consisting essentially of a perovskite-like manganite of at least one rare earth element selected from the group consisting of La, Pr and Nd in which the said rare earth element is partially replaced, characterized in that the said manganite is of a composition represented by the atom formula $RE_{1-x}M_xMnO_3$ in which RE is at least one element selected from the group consisting of La, Pr, and Nd; M is at least one element selected from the group consisting of Na, K, and Rb, in which x is from 0.1 to 0.4 and in which the amount of any of the indicated cations may be reduced by up to about 15 atom percent to accommodate vacancy structures.

3,884,838

RUTHENIUM-REDUCED AMORPHOUS TUNGSTEN OXIDE CATALYST

Donald Kingsley Fleming, Park Ridge, Ill.; Sarabjit Singh Randhava, Hartsdale, N.Y., and Elias Humberto Camara, Hickory Hills, Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 68,632, Sept. 1, 1970, Pat. No. 3,787,468. This application Oct. 4, 1973, Ser. No. 403,538

Int. Cl. B01j *11/08*

U.S. Cl. 252—470 4 Claims

1. A catalyst composition consisting essentially of ruthenium, having from 0 – 50 percent of said ruthenium alloyed with platinum, and reduced amorphous oxide of tungsten.

3,884,839

NEUTRON ATTENUATING CONSTRUCTION MATERIAL

Charles K. Bon, and Robert J. Moolenaar, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 16, 1971, Ser. No. 134,887

Int. Cl. C04b *41/24*; G21f *C04*

U.S. Cl. 252—478 3 Claims

1. A body suitable for building construction comprising an expanded clay porous body impregnated with at least from about 10 to about 50 weight percent of at least one inorganic neutron absorber selected from the group consisting of an alum having a melting temperature within the range of about 50°C to about 400°C, boric acid, hydrated ammonium and alkali metal borates, and hydrated sodium silicate, said impregnated body characterized by light weight and absorption of neutron flow.

3,884,840

GRAPHITE-PITCH ELECTRODE PASTE

Andrezej Antoni Florian Romanski; Michael John Allen; John Malcolm Fletcher; Ian Burnett Laing, and Harry Markham, all of Sheffield, England, assignors to British Steel Corporation, London, England

Filed Apr. 10, 1973, Ser. No. 349,789

Claims priority, application United Kingdom, Apr. 27, 1972, 19666/72; Dec. 9, 1972, 58717/72

Int. Cl. H01b *1/106*; H01j *1/88*

U.S. Cl. 252—511 4 Claims

1. A carbon electrode paste, the paste comprising a mixture of pitch and graphite, the graphite being of particle size 98% below 10 microns, the mixture being sufficiently viscous to be applied as a paste but to set and be substantially nonsticky at normal ambient temperatures, the viscosity of the pitch lying in the range 10 to 150,000 poises at 15.5°C, and the proportion of graphite powder to pitch lying in the range of 10 to 40 percent by weight.

3. Carbon electrodes coated with a paste comprising pitch and graphite powder on their faces which are to be brought together when joining two electrodes, the paste being nonsticky at ambient temperatures but melting to form an electrically conductive bond when two electrodes are joined together and heated to a high temperature, the viscosity of the pitch lying in the range 10,000 to 150,000 poises at 15.5°C, the proportion of graphite powder to pitch lying in the range of 10 to 40 percent by weight, and the particle size of the graphite being about 98 percent below 10 microns.

4. A method of joining two parts of a carbon electrode comprising coating the end faces of the two parts, which are subsequently to be brought together, with a paste comprising pitch having a viscosity between 10,000 and 150,000 poises at 15.5°C and graphite powder, the proportion of the graphite powder being 10 to 40 percent by weight of the pitch and the graphite powder having a particle size being about 98 percent below 10 microns, the paste being sufficiently viscous to be applied as a paste but to set on said end faces and be substantially non-sticky at room temperatures and, at a subsequent time, bringing the parts together with their end faces in contact, placing the electrode in a furnace and heating so that the paste melts and carbonises to form an electrically conducting bond between the two parts.

3,884,841

2-N-BUTYL 4,4,6-TRIMETHYL-1,3 DIOXANE PERFUME

Jan Th. M. F. Maessen, and David DeRijke, both of Naarden, Netherlands, assignors to Naarden International, N.V., Naarden-Bussum, Netherlands

Filed Mar. 29, 1974, Ser. No. 456,317

Claims priority, application Netherlands, Apr. 18, 1973, 7305487

Int. Cl. C11b *7/00*

U.S. Cl. 252—522 1 Claim

1. A perfume composition comprising from 5 to 16% of 2-n-butyl-4,4,6-trimethyl-1,3-dioxane in a perfume carrier.

3,884,842

PYRAZINE DERIVATIVE PERFUME COMPOSITIONS

Alan Bramwell, Cottenham; John William Kidman Burrell; Peter Ward, both of Ashford, and Alfred Hagemann, Folkestone, all of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 43,166, June 3, 1970, abandoned. This application Feb. 4, 1974, Ser. No. 439,181

Claims priority, application United Kingdom, June 10, 1969, 29388/69

Int. Cl. A61k 7/00

U.S. Cl. 252—522 1 Claim

1. A perfume composition consisting essentially of at least one known perfume ingredient selected from the group consisting of odoriferous aldehydes, odoriferous alcohols, odoriferous ketones and odoriferous esters and at least one alkoxyalkylpyrazine selected from the group consisting of 2-methoxy-3-sec.butylpyrazine, 2-methoxy-3-isobutylpyrazine and 2-n-propoxy-6-methylpyrazine in an amount varying from about 0.001 to about 1% by weight of the perfume ingredients.

3,884,843

ALKYL MONOMETHYL-RINGSUBSTITUTED-DIACETOXY-BENZOATE PERFUME COMPOSITIONS

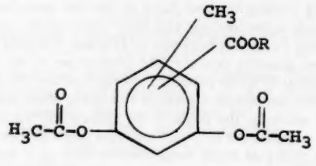
Kurt Kulka, New York, and Teodosij Zazula, Rego Park, both of N.Y., assignors to Fritzsche Dodge & Olcott Inc., New York, N.Y.

Filed Jan. 31, 1974, Ser. No. 438,248

Int. Cl. C11b 9/00

U.S. Cl. 252—522 10 Claims

1. A perfume composition comprising at least 1% by weight of an alkyl monomethyl-ringsubstituted-diacetoxy-benzoate and at least 1% by weight of an odoriferous perfume component, said alkyl monomethyl-ringsubstituted-diacetoxy-benzoate having the formula:



in which R is methyl or ethyl.

3,884,844

PROCESS FOR FORMING FOAMED POLYESTER RESINS

Mark Plunguian, 461 W. Chestnut Hill Rd., Newark, Del. 19711, and Charles E. Cornwell, 7104 Marlan Dr., Alexandria, Va. 22307

Filed Mar. 11, 1974, Ser. No. 449,593

Int. Cl. C08g 53/10

U.S. Cl. 260—2.5 N 6 Claims

1. A process for producing a cured cellular structure in a composition comprising (a) an unsaturated polyester formed by condensing at least one dicarboxylic acid containing α, β-ethylenic unsaturation with a dihydric alcohol, (b) an α, β-ethylenically unsaturated copolymerizable monomer, (c) a blowing agent, and (d) a nucleating agent, characterized by carrying out the copolymerization reaction under subatmospheric pressure at a range of about 180 to 50 Torr.

3,884,845

POLYCATIONIC INTERFERON INDUCER

David L. Steward, Carmel, Ind., and Wen-Hong Tong, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 382,975, July 26, 1973. This application Jan. 2, 1974, Ser. No. 430,308

Int. Cl. C08g 33/08

U.S. Cl. 260—2 EN 4 Claims

1. A condensation polymer of polyethylenimine with pentachloropyridine wherein the gram atomic ratio of polyethylenimine nitrogen to pentachloropyridine nitrogen is from about 2:1 to about 8:1 and the molecular weight is about 600 to about 60,000.

3,884,846

PROCESS FOR PRODUCING MATERIALS WHICH COMPLEX HEAVY METALS IN LIQUID

Susumu Otsuki; Isao Miyanohara; Norimasa Mizui, and Hideo Kawamura, all of Shin Nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed May 17, 1973, Ser. No. 361,313

Claims priority, application Japan, May 23, 1972, 47-50376; May 30, 1972, 47-53010

Int. Cl. C08f 27/08, 27/02

U.S. Cl. 260—2.2 R 12 Claims

1. A process for the production of a heavy metal complexing material which comprises reacting a reaction product from the partial dehydrochlorination reaction of polyvinylchloride from which 5 –90% of its chlorine content is removed, with at least one amine reagent selected from the group consisting of alkylamines, alkylpolyamines, and hydroxyamines.

3,884,847

PROCESS FOR THE PREPARATION OF SO-CALLED COLD-CURED FLEXIBLE POLYURETHANE

Pierre Pruvost, Lyon, and Jacques Cluchat, Saint-Cord, both of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed July 19, 1973, Ser. No. 380,693

Claims priority, application France, July 20, 1972, 72.26231

Int. Cl. C08g 22/44

U.S. Cl. 260—2.5 AH 5 Claims

1. Process for the production of cold-cured flexible polyurethane foams by pouring into a mould, a foamable composition that will react in the mould to form a flexible polyurethane foam without external application of heat, closing the mould, forming the foam and releasing the foam from the mould, wherein the foamable composition contains 0.1 to 5% of its weight of an organosilicon compound which is a compound of the general formula:

$$(T)_a Si[OSi(CH_3)R'_2]_{4-a} \qquad F_1$$

in which each symbol R', which may be the same or different, represents a hydrogen atom, a monovalent hydrocarbon group of 1 to 8 carbon atoms, or a monovalent halogenohydrocarbon group of 1 to 3 carbon atoms; each symbol T, which may be the same or different, represents a hydrogen atom, an alkyl radical with 1 to 15 carbon atoms, a halogenalkyl radical with 1 to 3 carbon atoms, an alkenyl radical with 2 to 4 carbon atoms or a cycloaliphatic radical with 5 to 6 carbon atoms in the ring and a represents zero, 1 or 2.

3,884,848

MANUFACTURE OF MEMBRANE-FREE NONLUSTROUS POLYURETHANE FOAM

Michael A. Ricciardi, Conyngham; Michael L. Cordora, Exeter, both of Pa., and David Smudin, Piscataway, N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Continuation-in-part of Ser. No. 415,609, Nov. 14, 1973, abandoned. This application Jan. 7, 1974, Ser. No. 431,512

Int. Cl. C08g *22/44*

U.S. Cl. 260—2.5 BD 11 Claims

1. In a process for the preparation of a flexible cellular solid urethane polymer from a reaction mixture including a polyol, an organic polyisocyanate, a blowing agent and a hydrophilic organsilicon foam-stabilizing emulsifier-surfactant designed and adapted for use in the preparation of urethane polymer foam from a polyether polyol and an organic polyisocyanate, the improvement which comprises employing as the polyol reactant (1) a polyether polyol or (2) a polyester polyol admixed with at least two percent by weight of a polyether polyol, based upon the weight of the mixture of polyester polyol and polyether polyol, and including in the reaction mixture at least one ester of the formula (RCOO)n R′ in a suitable proportion whereby a nonlustrous, substantially membrane-free foam is obtained, R and R′ in the preceding formula being alkyl or alkenyl groups having from one to 30 carbon atoms, at least one of R and R′ having at least three carbon atoms, and *n* being an integer from 1 to 3, with the proviso that when *n* is one at least one of R and R′ has at least eight carbon atoms.

3,884,849

FLAME RETARDANT FLEXIBLE URETHANE FOAMS

Robert A. Molbert, Akron, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Dec. 26, 1973, Ser. No. 427,880

Int. Cl. C08g *22/46, 51/56, 51/62*

U.S. Cl. 260—2.5 BB 12 Claims

1. In the production of a flexible or semi-flexible low density, flame retardant polyurethane foam using the one-shot or prepolymer process by the reaction of (A) a polyetherpolyol having from two to four hydroxyl groups and having a molecular weight of from about 1,000 to 10,000, (B) an organic polyisocyanate and (C) a blowing agent comprising water in admixture with (D) a surfactant, (E) a catalyst, (F) from about 1 to 50 parts by weight per 100 parts by weight of said polyol of a finely divided, solid chlorine-containing polymeric resin having an intrinsic viscosity of from about 0.25 to 2.5, (G) finely divided zinc oxide in an amount of from about 0.1 to 10 parts by weight per 100 parts by weight of said polyol, and (H) finely divided antimony trioxide in an amount of from about 0.5 to 15 parts by weight per 100 parts by weight of said polyol, the improvement comprising incorporating in said formulation prior to foaming a zinc salt of an organic monocarboxylic acid, said salt having from 1 to 25 carbon atoms in each acid moiety of said salt, and said salt being used in an amount of from about 0.01 to 0.90 part by weight, computed as metallic zinc, per 100 parts by weight of total polyol, to prevent or reduce discoloration of said foam during the production of the same.

3,884,850

CONTINUOUS ATMOSPHERIC DEPOLYMERIZATION OF POLYESTER

Henry S. Ostrowski, 3729 Country Ridge Rd., Charlotte, N.C. 28211, assignor to Fiber Industries, Inc., Charlotte, N.C.

Filed Feb. 13, 1970, Ser. No. 11,221

Int. Cl. C07c *69/82*

U.S. Cl. 260—2.3 9 Claims

1. A process for continuously depolymerizing high molecular weight linear polyester scrap said polyester being the polycondensation product of a dihydric alcohol and a dicarboxylic acid comprising dissolving said polyester scrap at an elevated temperature in a solvent which is liquid at the dissolving temperature, said solvent being selected from the group consisting of monomeric ester, bisester, low molecular weight esters and oligomers of said high molecular weight polyester to form a depolymerization mixture, continuously adding with said scrap polyester, dihydric alcohol corresponding to the dihydric alcohol of said polyester scrap in a stoichiometric excess sufficient to produce the desired degree of depolymerization to at least an oligomer, effecting said depolymerization under atmospheric pressure at a temperature above the boiling point of said dihydric alcohol but below the melting point of said polyester and continuously recovering lower molecular weight depolymerizate.

3,884,851

PRIMER FOR TREATING METAL SURFACES

Woodrow E. Kemp, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 64,613, Aug. 17, 1970, abandoned, and a continuation-in-part of Ser. No. 785,358, Dec. 19, 1968, abandoned. This application May 19, 1972, Ser. No. 255,128

Int. Cl. C08c *13/00;* C08g *41/04*

U.S. Cl. 260—3.3 10 Claims

6. A coating composition for the priming of a metal surface, said coating composition consisting essentially of, by weight:

a. 1 part chlorinated natural rubber having about 50 to 67% by weight total chlorine;

b. from 1/18 to 1 part of a polyamide resin that is the condensation product of a polyalkylene-polyamine and an unsaturated fatty acid; and

c. from 1 to 3 parts of an inert volatile solvent that has an evaporation rate between the evaporation rate of toluene and high flash naphtha and that dissolves both said chlorinated rubber and polyamide resin.

3,884,852

ACRYLIC COATING COMPOSITION FOR FINISHING FLEXIBLE SUBSTRATES

Ronald J. Sheppard, Flushing, Mich., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

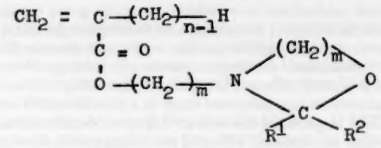
Division of Ser. No. 285,094, Aug. 30, 1972, Pat. No. 3,824,397. This application May 9, 1974, Ser. No. 468,481

Int. Cl. C08b *21/08;* C08f *37/18;* C03f *37/06;* C08f *45/38*

U.S. Cl. 260—17 R 5 Claims

1. A coating composition which comprises 40 to 60% by volume, based on the total volume of the coating composition of Composition I and correspondingly, 60 to 40% by volume, based on the total volume of the coating composition of Composition II; wherein Composition I consisting essentially of 10–50% by weight of film-forming binder and correspondingly, 90–50% by weight of an organic solvent for the binder wherein the binder consists essentially of

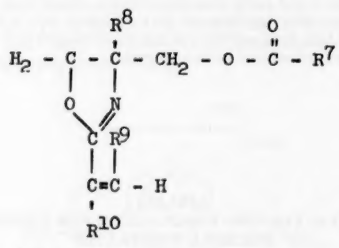
1. 35–65% by weight, based on the weight of the binder, of a copolymer consisting essentially of the reaction product of 80–90% by weight of methyl methacrylate and correspondingly, 10–20% by weight of an alkyl acrylate or an alkyl methacrylate having 2–12 carbon atoms in the alkyl groups;
2. 5–20% by weight, based on the weight of the binder, of a copolymer consisting essentially of the reaction product of 85–95% by weight of methyl methacrylate and 5–15% by weight of polymerized adhesion promoting monomer of the formula



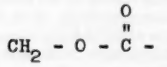
wherein n is 1–2, m is 2–3 and R^1 and R^2 are selected from the group consisting of hydrogen, phenyl, benzyl, an alkyl group having 1–12 carbon atoms, or in combination are 2,2-spirocyclohexyl; and

3. 30–50% by weight, based on the weight of the binder, of an organic plasticizer of a phthalate ester or an alkyd resin; and Composition II comprises a pigmented coating composition containing 0.1–20% by weight pigment and 10–50% by weight, based on the weight of the coating composition, of a film-forming binder which consists essentially of

1. 40–60% by weight, based on the weight of the film-forming binder, of an acrylic oxazoline polymer which consists essentially of
   a. 30–70% by weight of methyl methacrylate;
   b. less than about 35% by weight of an alkyl acrylate methacrylate having 2–12 carbon atoms in the alkyl group;
   c. less than about 10%, by weight of acrylonitrile;
   d. 15–35% by weight of a compound of the formula



wherein R^7 is a saturated hydrocarbon group of 3–21 carbon atoms or an unsaturated hydrocarbon group of 3–21 carbon atoms; R^8 is H, an alkyl group having 1–4 carbon atoms or



R^9 is H, an alkyl group having 1–4 carbon atoms; R^{10} is a saturated hydrocarbon group having 2–20 carbon atoms or an unsaturated hydrocarbon group having 2–20 carbon atoms;

2. 60–40% by weight, based on the weight of the binder, of cellulose acetate butyrate having a viscosity of 0.5–20 seconds measured at 25°C. according to AST-M-D-1343-56 and a butyryl content 30–55 by weight; and

3. 0–10% by weight, based on the weight of the binder, of an organic plasticizer of a phlhalate ester on an alkyd resin.

3,884,853

ALKALI-CURABLE CATIONIC/ANIONIC STARCH FOR PAPER COATING BINDERS

Jerrel L. Zimmerman, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Nov. 14, 1973, Ser. No. 415,913
Int. Cl. C08b *25/02*
U.S. Cl. 260—17.3 **16 Claims**

1. A coating color composition for paper and paperboard substrates comprising:

a. a coating clay comprising 20–98 parts, dry substance basis, of the total solids of a coating color having 35–68% solids;

b. 1–40 parts, dry substance basis, of the dry substance basis weight of the clay of a cooked amphoteric (cationic-anionic) starch derivative having a cationic group degree of substitution in the range from 0.0075 to 0.05, said cationic groups being derived by the reaction of the starch with chlorohydroxypropyl quaternary ammonium chloride, said amphoteric starch derivative having an anionic group degree of substitution ranging from 0.018 to 0.0705, said anionic groups being derived from the reaction of the quaternary ammonium starch ether with maleic anhydride using triethylamine catalyst; and the ratio of cationic groups to anionic groups is such that the net anionic group degree of substitution is at least equal to the net cationic group degree of substitution; and

c. 1–40 parts, dry substance basis, of a latex binder based on the total weight, dry substance basis of the clay, provided that the total weight of said latex is at least equal to the total weight of the amphoteric starch, dry substance basis; said coating color composition being capable of self-crosslinking insolubilization due to the presence of maleic anhydride.

3,884,854

PROCESS FOR PREPARING POLYETHYLENE TEREPHTHALATE OF IMPROVED COLOR

John J. Ventura, Eatontown, and Philip H. Ravenscroft, Edison, both of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

Filed June 16, 1969, Ser. No. 833,805
Int. Cl. C08g *17/013*
U.S. Cl. 260—22 CA **7 Claims**

1. A process for preparing polyethylene terephthalate of improved color, as determined by the difference between the luminance value and yellowness index of the polymer, wherein dimethyl terephthalate is reacted with ethylene glycol to form an ester of ethylene glycol and terephthalic acid or where terephthalic acid is reacted with ethylene glycol to form an ester of terephthalic acid and ethylene glycol wherein the resulting ester is polycondensed in the presence of a catalytic amount of a polycondensation catalyst consisting of

a. an antimony compound having one of the following formulae:

$$Sb(Y)_n \text{ or } Y_3Sb=O; \text{ and}$$

b. an arsenic compound having one of the following formulae:

$$As(Y)_n,\ As_2O_3,\ As_2O_5 \text{ or } Y_3As=O,$$

wherein n is 3 or 5 and each Y is individually selected from the group of monovalent radicals consisting of —R, —OOCR, —OR, —SR, OOCR'SH and SR'COOR wherein R is in turn selected from the group consisting of alkyl, cycloalkyl, aryl, aralkyl and alkaryl radicals and R' is a divalent radical selected from the group consisting of alkylene, cycloalkylene, arylene, aralkylene and alkarylene radicals.

3,884,855
PROCESS FOR THE PRODUCTION OF REGENERATE FROM POLYPROPYLENE WASTE

Reinhold Baumann, Hausen; Robert Lauerbach-Lemeier; Ernst-Günter Kunze, both of Frankfurt am Main; Alfred Striebich, Bischofsheim, and Hans-Joachim Rothe, Bad Vilbel, all of Germany, assignors to Davy-Ashmore Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 237,174, March 22, 1972, Pat. No. 3,789,026. This application Nov. 2, 1973, Ser. No. 412,133

Claims priority, application Germany, Mar. 24, 1971, 2114304

Int. Cl. C08f *47/24, 29/02*

U.S. Cl. 260—2.3 **12 Claims**

1. A process for the production of regenerate from the waste product from a process for producing synthetic polypropylene fibers, said polypropylene waste products comprising wool, fibers, bands or foil which comprises the steps of:

i. cutting the polypropylene waste product to produce a cut waste product;

ii. spreading the cut waste products into a fleece;

iii. washing said fleece in a washing zone to produce a wet, washed fleece;

iv. drying the washed fleece in a drying zone to produce a dried fleece;

v. dividing said fleece into fiber clusters;

vi. compacting the fiber clusters to produce a compacted waste material; and

vii. granulating the compacted waste material to produce a regenerate.

3,884,856
ELECTROCOATING COMPOSITION CONTAINING STYRENE-MALEIC ANHYDRIDE COPOLYMER AND EPOXY ESTER RESIN EXHIBITING HIGH THROWING POWER

John F. Motier, Secane, Pa., and Donald L. Marion, Turnersville, N.J., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Nov. 19, 1973, Ser. No. 416,906

Int. Cl. C08g *45/08*

U.S. Cl. 260—23 EP **15 Claims**

1. A composition suitable for electrocoating an electrically conductive substrate in an aqueous medium using high voltages and characterized by exhibiting high throwing power and crosslinkable by oxygen promoted radical graft polymerization comprising:

a. a partial ester of styrene maleic anhydride copolymer resin esterified to about 25 to 125 per cent half-ester with a saturated or olefinically unsaturated alkanol of 12 to 30 carbon atoms said styrene-maleic anhydride copolymer having a mole ratio of styrene to maleic anhydride of about 1:1 to 4:1 and a molecular weight of about 500 to 4000, said partial ester of said copolymer having an acid number in the range of about 20 to 350 and neutralized to the extent of 20 to 120 per cent based on said acid number of said partial ester copolymer with a neutralization agent selected from the group consisting of ammonia, lower aliphatic amines, lower alkanol amines and alkali metal hydroxides and

b. a carboxyl functional epoxy resin esterified with an olefinically unsaturated fatty acid, said olefinically unsaturated fatty acid being derived from a semi-drying oil or drying oil having an iodine value of greater than 90, said carboxyl functionality being provided by either (1) half acid ester formation between residual hydroxyl groups of the epoxy ester resin and a dicarboxylic acid anhydride, or (2) by reaction of maleic anhydride with olefinic sites on the unsaturated fatty acid moieties of said esterified epoxy resin, said epoxy ester provided with carboxyl functionality having an acid nunber in the range of from 40 to 80 and neutralized to the extent of 20 to 120 per cent based on said acid number of said resin with a neutralization agent selected from the groups consisting of ammonia, a lower aliphatic amine, a lower alkanol amine and an alkali metal hydroxide wherein said epoxy resin is in the range of from 30 to 300 weight per cent of said esterified copolymer and wherein said esterified copolymer and said epoxy resin range in amount from 5 to 30 weight per cent of said aqueous medium.

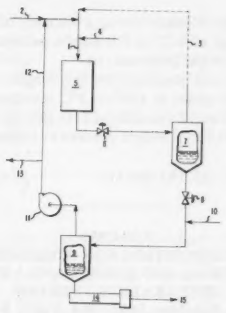
3,884,857
LOW GEL CONTENT ETHYLENE COPOLYMER/WAX BLENDS AND PROCESS FOR PREPARATION THEREOF

Edward Cooper Ballard, and John Ricks Priest, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 143,311, May 14, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 349,484

Int. Cl. C08f *45/52*

U.S. Cl. 260—28.5 AV **25 Claims**



1. In a continuous, high-pressure, free radical polymerization process for preparing ethylene copolymers having reduced gel content comprising

a. introducing ethylene and at least one monomer selected from the group consisting of vinyl esters of C_1 to C_4 monobasic aliphatic acids, acrylates and methacrylates wherein the alcohol moiety is derived from aliphatic C_1 to C_4 monohydroxy alcohols, acrylic acid, methacrylic acid, maleic acid, and maleic anhydride, provided that at least 85 mol percent of the monomers is ethylene and sufficient amount of said vinyl ester, acrylate or methacrylate monomer is introduced to yield at least about 5 weight percent of units derived from said monomer in the resulting copolymer, and an initiator into the reactor,

b. maintaining said monomers and initiator in contact in said reactor at a temperature of about 100°C. –250°C. and a pressure of about 1,000–2,500 atmospheres until the desired extent of conversion to ethylene copolymers has been obtained,

c. removing the reaction mixture from said reactor,

d. reducing the pressure by first pressure let-down means such that the reaction mixture enters a first separator at about 100–400 atmospheres,

e. separating out from said reaction mixture in said first separator about 90–97 percent of the unreacted monomers,

f. further reducing the pressure by second pressure let-down means such that the reaction mixture enters a second separator at about 0–5 atmospheres, and

g. separating out from said reaction mixture in said second separator substantially all of the remaining about 3–10 percent by weight of unreacted monomers,

the improvement in said process comprising the in-line addition of about 5–50 percent by weight based on the total weight of the copolymer and wax, of molten petroleum, polyethylene

or Fischer-Tropsch wax to said ethylene copolymer reaction mixture after the pressure has been reduced to below about 250 atmospheres and after at least about 90 percent by weight, but not more than about 97 percent by weight, of the unreacted monomers have been separated out from said reaction mixture.

3,884,858

PROCESSING OF THERMOPLASTIC POLYESTERS

Gottfried Morawetz, Kufstein, Tirol, Austria, assignor to Ciba-Geigy Corporation, Basel, Switzerland

Filed Mar. 27, 1972, Ser. No. 238,642

Claims priority, application Austria, Mar. 20, 1971, 2670/71

Int. Cl. C08g *17/04*

U.S. Cl. 260—29.15 B **5 Claims**

1. A process of molding saturated polyester by contacting a liquid composition with a heated metal surface during solidifying said composition consisting essentially of

a. linear saturated polyester from aromatic dicarboxylic acid and

b. polydimethyl siloxane having a viscosity of 35 to 200 cSt, in an amount of 0.25 to 0.8 weight percent in relation to the weight of the polyester, or

c. a synthetic wax produced by the Ziegler process with a solidification point at 109°–113°C, a molecular weight of about 1,600 and a viscosity of 110–130 cp at 150°C, in an amount of 0.5 to 6 weight percent in relation to the polyester, and

d. mixtures of (a), (b) and (c).

3,884,859

ADHESIVE COMPOSITION FOR ADHESION BETWEEN FABRIC MATERIAL AND RUBBER AND A PROCESS FOR PREPARATION THEREOF

Toshio Honda; Takehiro Ueki, and Yukio Fukuura, all of Tokyo, Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1972, Ser. No. 298,584

Claims priority, application Japan, Oct. 26, 1971, 46-84373

Int. Cl. C08g *51/24*

U.S. Cl. 260—29.3 **3 Claims**

1. In a process for making a synthetic fabric-to-rubber adhesive having improved stability and improved adhesion for bonding synthetic fabric and natural rubber, styrene-butadiene copolymer and high ratio blends of styrene-butadiene-natural rubber copolymers comprising mixing a synethic rubber latex with an aqueous, alkaline, aldehyde-free resole solution; the improvement comprising preparing said resole by reacting one mole of a monohydric phenol selected from phenol and an alkyl phenol with from about 4–10 moles of formaldehyde or an aldehyde polymer, in a solvent, employing an alkali metal hydroxide catalyst at a temperature from about 30° – 100°C. to form a resole resin having a molecular weight from about 200 to 2500; separating said resole resin by neutralizing the reaction mixture with an acid drying and; dissolving the separated resin in dilute ammoniacal solution free of aldehyde and thereafter mixing the resulting solution with the rubber latex in the weight ratio of 2 – 50 parts resin per 100 parts rubber latex solids.

3,884,860

CARBOXY-FUNCTIONAL SILICONES

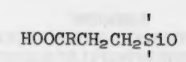
Lawrence H. Brown, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Apr. 15, 1974, Ser. No. 460,849

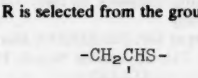
Int. Cl. C08f *11/04*

U.S. Cl. 260—29.2 M **8 Claims**

1. A copolymeric organopolysiloxane consisting essentially of (a) from 10 to 65 mol percent of siloxy units selected from the group consisting of $HOOCRCH_2CH_2SiO_{3/2}$ and



in which R is R is selected from the group



and divalent radicals consisting of carbon, hydrogen and sulfur, the sulfur atoms being present in the form of thioether linkages, said divalent radical containing from 1 to 7 carbon atoms; and R′ is selected from the group consisting of methyl, phenyl and vinyl radicals; and (b) from 35 to 90 mol percent of siloxy units of the formula $R'_nSiO_{(4-n)/2}$ in which R′ is as defined and n is an integer having a value of from 1 to 3; at least 30 mol% of all the siloxane units in said copolymer having a degree of substitution of 1, said siloxane copolymer having an overall degree of substitution of from about 1.2 to 1.8 with from 15 to 55 percent of the total substituents present being phenyl groups.

3,884,861

SOIL GROUTING PROCESS AND COMPOSITION

Anthony J. Whitworth; Stephen Yi-Sun Tung, both of Scarsborough, Ontario, and Ernest Anthony Hajto, Willowdale, Ontario, all of Canada, assignors to Borden, Inc., Columbus, Ohio

Continuation of Ser. No. 271,530, July 13, 1972, which is a division of Ser. No. 51,359, June 30, 1970, Pat. No. 3,686,872.

This application Apr. 12, 1974, Ser. No. 460,424

Claims priority, application United Kingdom, May 19, 1970, 24269/70

Int. Cl. C08g *51/24*

U.S. Cl. 260—29.3 **2 Claims**

1. An aqueous gel-forming composition, useful in stabilizing soil, having a pH of about 8.5–11.5 and containing dispersed therein

a. between about 2 and 45 percent of a polyphenolic vegetable material selected from the group consisting of tannin extracts, catechins and alkaline extracts of coniferous tree barks, said polyphenolic material being soluble in alkaline solution, able to gel rapidly and having a formaldehyde combining capacity of at least 5.0,

b. based on 100 parts of polyphenolic material, between about 5 and 30 parts of formaldehyde and/or paraformaldehyde or between about 10 and 90 parts of a phenol formaldehyde resole and

c. a gelling compound, soluble or colloidally dispersible in said aqueous composition, said gelling compound being selected from the group consisting of the vanadates, molybdates, manganates, permanganates, titanates, cuprates, and zirconates of potassium, sodium, lithium and ammonium and the chlorides, sulfates, nitrates, hydroxides and oxides of vanadium, molybdenum, manganese, titanium, copper, zinc and zirconium, said compound being present in an amount corresponding to between about 0.01 and 10 parts of the vanadium, molybdenum, manganese, titanium, copper, zinc or zirconium therein per 100 parts of polyphenolic material.

3,884,862

ADHESIVE COMPOSITION AND METHOD OF MAKING SAME

Kenneth Francis King, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 37,842, May 15, 1970, abandoned, which is a continuation-in-part of Ser. No. 26,772, April 8, 1970, abandoned. This application Feb. 9, 1972, Ser. No. 224,911

Int. Cl. C08g 51/24

U.S. Cl. 260—29.3 5 Claims

1. A liquid adhesive composition having a total solids content of about 10–40% by weight prepared by

1. dry milling an elastomer selected from the group consisting of copolymers of about 60–84% by weight of ethylene and about 16–40% by weight of 1,4-hexadiene having an unsaturation value of about 2-4 and copolymers of about 50–62% by weight of ethylene, about 20–42% by weight of propylene and about 4–16% by weight of 1,4-hexadiene or 5-ethylidene-2-norbornene having an unsaturation value of about 0.25–2 with a reinforcing carbon black until the carbon black is substantially uniformly dispersed in the elastomer, the weight ratio of the carbon black to the elastomer being about 25:75 to 50:50,
2. mixing the resulting milled blend with an organic solvent for the elastomer until the elastomer is in solution in the solvent and a liquid composition is formed,
3. forming an emulsion of the composition obtained in step 2 in water by mixing said composition in a high-shear mixer with water containing an emulsifying agent,
4. removing said solvent from the resulting emulsion, and
5. mixing with the resulting latex a resorcinol-aldehyde resin component selected from the group consisting of a mixture of resorcinol and an aldehyde capable of forming a heat-hardenable resin, the resorcinol: aldehyde molar ratio being about 1:0.05 to 1:2 and a heat-hardenable resin made from said mixture the weight ratio of the elastomer to the resin being about 50:50 to 91:9.

3,884,863

ZINC ENRICHED LITHIUM SILICATE-LATEX COATING COMPOSITION

Ronald W. Beers, Spring, Tex., and Julian Lakritz, Edison, N.J., assignors to Exxon Research & Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 93,389, Nov. 27, 1970, abandoned, which is a continuation of Ser. No. 708,785, Feb. 28, 1968, abandoned. This application Dec. 29, 1972, Ser. No. 319,969

Int. Cl. C08d 7/02; C08f 45/24; C09d 5/10

U.S. Cl. 260—29.6 S 6 Claims

1. A homogeneous vehicle for a zinc-enriched, self-curing, water-resistant coating composition consisting essentially of:

a. between about 57 to 91 parts of an aqueous alkali-lithium silicate solution, said alkali and lithium silicates being employed in amounts sufficient to provide a molar ratio of X_2O, where X is selected from the group consisting of sodium, potassium, and quaternary ammonium, to lithium oxide to silicon dioxide, respectively, within the range from about 0.25 to 0.65 X_2O: 0.35 to 0.75 Li_2O: 2.5 to 4.5 SiO_2;

b. between 9 and 40 parts of a film-forming organic alkali stable latex of an interpolymer selected from the group consisting of interpolymers of methyl methacrylate/butyl acrylate/aminoester of an unsaturated carboxylic acid; and

c. between 0 and 3 parts of an alkali stable anionic surfactant.

3,884,864

PROCESS FOR PREPARATION OF NONFLAMMABLE WATER-CONTAINING POLYMER MATERIAL FROM BASIC SALTS OF POLYMERIZABLE MIXTURES OF ETHYLENICALLY UNSATURATED PHOSPHATES

Hideaki Matsuda, Marugame; Fujio Yamauchi, Kanonji; and Hisakazu Mori, Kagawa-ken, all of Japan, assignors to Okura Kogyo Kabushiki Kaisha, Japan

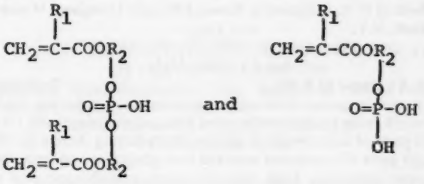
Continuation of Ser. No. 117,115, Feb. 19, 1971, abandoned. This application May 14, 1973, Ser. No. 360,058

Claims priority, application Japan, Feb. 21, 1970, 45-14948; Feb. 28, 1970, 45-17221

Int. Cl. C08g 45/24

U.S. Cl. 260—29.7 NR 9 Claims

1. A process for preparing a non-flammable, resinous water-containing cured composition which is insoluble and infusible, which comprises adding water to a mixture of A and B or A, B and C, wherein A is a basic salt of a polymerizable mixture of phosphates containing at least one compound from each of the formulae



and

or partial alkylene oxide addition products of said compounds having an acid value of at least one-half the initial acid value of the mixture of phosphates, wherein R_1 is hydrogen or methyl and R_2 is a lower alkylene or halogenated lower alkylene group, B is a polymerizable ethylenically unsaturated monomer and C is an unsaturated polyester obtained by reacting the components of a mixture containing propylene glycol and maleic anhydride, to obtain a water-in-oil emulsion, adding a polymerization catalyst selected from the group consisting of benzoyl peroxide, azobis isobutylonitrile, potassium persulfate, ammonium persulfate, hydrogen peroxide and soda perborate to the emulsion and curing the resultant mixture at from room temperature to 80°C,

the quantity of water being 10–200% by weight based on the weight of the A and B mixture or the A, B and C mixture, the weight ratio of B to A in the A and B mixture being from 0.5:1 to 2.0:1,

the weight ratio of B+C to A and of B to C in the A, B and C mixture being from 0.5:1 to 3.0:1 and from 4:1 to 1:1, respectively.

3,884,865

PLASTICIZED POLYVINYL BUTYRAL INTERLAYERS

Robert H. Fariss, Amherst, and James A. Snelgrove, Monson, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed June 18, 1973, Ser. No. 371,014

Int. Cl. C08f 45/38

U.S. Cl. 260—31.8 R 12 Claims

1. A polyvinyl butyral interlayer for laminated safety glass having a molecular weight in the range of from 30,000 to 600,000, from 0 to 10% by weight residual ester groups, calculated as polyvinyl ester, and a hydroxyl content in the range of from 12 to 20% by weight calculated as polyvinyl alcohol which is plasticized with from 15 to 45 parts by weight of dihexyl adipate per hundred parts of polyvinyl butyral resin; wherein the sum of (a) 3.2 times the percent polyvinyl alcohol content and (b) the parts of plasticizer per hundred parts of resin is equal to or less than 100; and wherein the plasticized

interlayer has a 100% tensile modulus at 72°C. in the range of from 100 to 1000 psi.

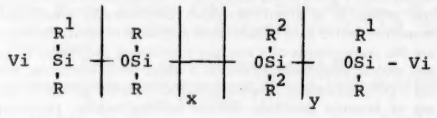
3,884,866

HIGH STRENGTH ORGANOPOLYSILOXANE COMPOSITIONS

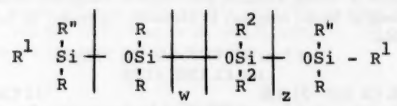
Edward M. Jeram, Burnt Hills, and Richard A. Striker, Troy, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Apr. 13, 1973, Ser. No. 351,107
Int. Cl. C08g *51/34*
U.S. Cl. 260—32.8 SB **7 Claims**

1. An organopolysiloxane composition combining high strength with exceptionally good elongation comprising (A) 100 parts of a combination of ingredients having therein (i) 20 to 90 parts of a polymer selected from the class consisting of a vinyl-containing high viscosity organopolysiloxane and a blend of vinyl-containing high viscosity organopolysiloxanes having no more than 25 mole percent phenyl radicals having a viscosity of 5,000 to 1,000,000 centipoise at 25°C of the formula,



where Vi stands for vinyl, R^1 is selected from the class consisting of lower alkenyl, alkyl, and aryl radicals, and R is selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, R^2 is selected from the class consisting of alkyl and aryl radicals, x varies from 100 to 10,000, y varies from 0 to 300; (ii) from 5 to 40 parts of a polymer selected from the class consisting of a low viscosity vinyl-containing organopolysiloxane and a blend of low viscosity vinyl-containing organopolysiloxanes having a vinyl content that may vary from 0.01 mole percent vinyl to 60 mole percent vinyl and a viscosity that varies from 50 to 5,000 centipoise at 25°C and having no more than 25 mole percent phenyl radicals of the formula,



wherein R^1, R^2 and R are as previously defined, R'' is selected from the class consisting of alkyl, aryl and alkenyl radicals, w varies from 0 to 500 and z varies from 0 to 200; (iii) from 5 to 70 parts of a filler; (iv) from 0.1 to 50 parts per million of (A) and (B) of a platinum catalyst; and (B) from 1 to 100 parts based on 100 parts of the combination of ingredients of (A) of a material selected from the class consisting of hydrogen containing silanes and hydrogen containing polysiloxanes and mixtures thereof.

3,884,867

SELF-EXTINGUISHING POLYOXYMETHYLENE MOLDING COMPOSITIONS REINFORCED WITH GLASS FIBERS

Albrecht Hilt; Bruno Sander, both of Ludwigshafen; Willia Hild, Limburgerhof; Hugo Fuchs, Ludwigshafen, and Franz Schmidt, Mannheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 7, 1972, Ser. No. 278,585
Claims priority, application Germany, Aug. 11, 1971, 2140195
Int. Cl. C08g *51/10*
U.S. Cl. 260—37 AL **7 Claims**

1. A self-extinguishing molding composition based on a polyoxymethylene characterized by a content of from 5 to 15% by weight (based on the total weight of the molding composition) of finely divided neutral or basic red phosphorus and by a content of from 1 to 40% by weight (based on the total weight of the molding composition) of glass fibers.

3,884,868

COATING COMPOSITIONS COMPRISING POLYIMIDES AND POLYSILOXANES

Robert T. Trice, Fort Wayne; Gordon D. McLeod; Amos R. Anderson, both of Adrian, and Dennis C. Wilson, Fort Wayne, all of Ind., assignors to Phelps Dodge Industries, Inc., New York, N.Y.

Filed May 17, 1973, Ser. No. 361,133
Int. Cl. C08g *47/04*
U.S. Cl. 260—37 N **12 Claims**

1. A non-porous, durable, tough coating composition having good release properties, good resistance to thermal degradation, and good cut, scratch and abrasion resistance comprising an essentially linear, high molecular weight polyaromatic, polycarboxylic aromatic polyimide and a miscible phenyl and methyl substituted polyfunctional polysiloxane having a degree of substitution from about 1.0 to about 1.5 in an amount up to about 100 percent weight of said imide.

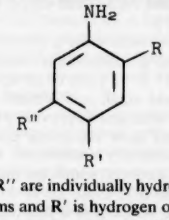
3,884,869

COLORING SYSTEM FOR THERMOSETTING PLASTIC COMPOSITIONS

Joseph Clyde Conger, Sr., Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 8, 1974, Ser. No. 431,799
Int. Cl. C08g *51/04*
U.S. Cl. 260—38 **10 Claims**

1. A process for coloring a thermosetting plastic composition which comprises adding to said composition from about 0.5 to 3.0 weight percent, based on the weight of said composition, of the by-product obtained in the preparation of a triphenylmethane dye by reacting a total of three moles of one or more monocyclic aromatic amines of the general formula



wherein R and R'' are individually hydrogen or alkyl of one to two carbon atoms and R' is hydrogen or methyl, said reaction being carried out under acidic conditions in the presence of an oxidizing agent and an oxidation catalyst with the following provisions:

1. when the three moles of amine individually selected contain R' as hydrogen, one mole of formaldehyde is present to form the melamine moiety;

2. when one of the three moles of amine individually selected contains R′ as a methyl group, said methyl group forms the methane moiety; and
3. only one of the three moles of amine individually selected contains R′ as a methyl group; said by product being the residue remaining after removal of the triarylmethane dyes from the dye product produced in said preparation.

3,884,870
POLYETHYLENE TEREPHTHALATE FILM

Keith D. Dodson, Greenville, S.C., and Thomas G. Squires, Durango, Colo., assignors to Celanese Corp., New York, N.Y.

Filed July 15, 1974, Ser. No. 488,593
Int. Cl. C08g *51/04*
U.S. Cl. 260—40 R **9 Claims**

1. A biaxially oriented polyethylene terephthalate film characterized by the inclusion of a small particle size inert additive having an average particle size ranging between about 10 and 1,000 millimicrons and provided in a concentration in the range of between about 0.3 percent and 2.5 percent by weight of the total film and further characterized by the inclusion of a large particle size inert additive having an average particle size in the range of between about 0.5 and 30 microns, said large particle size inert additive present in a concentration in the range of between about 0.002 percent and 0.018 percent by weight of the film, said large particle size and said small particle size inert additives being substantially completely dispersed throughout said film wherein said film has a thickness no greater than 2 mils, a haze not in excess of 2.5 percent, and a kinetic coefficient of friction not in excess of 0.7.

3,884,871
PROCESS FOR COATING PIGMENT PARTICLES WITH ORGANIC POLYMERS

Daniel F. Herman, Princeton, and Dominic Simone, Lyncroft, both of N.J., assignors to N L Industries, Inc., New York, N.Y.

Filed June 29, 1973, Ser. No. 374,937
Int. Cl. C08f *45/04*
U.S. Cl. 260—42.14 **7 Claims**

1. A process for the coating of titanium dioxide pigment particles to form discrete pigment particles individually coated with organic polymers which comprises the steps of:
   a. adding to a water slurry of titanium dioxide pigment particles wherein said particles comprise 70% by weight of said slurry, a polyanionic dispersing agent selected from the group consisting of sodium hexametaphosphate, potassium tripolyphosphate, and sodium salt of polycarboxylic acid in an amount equivalent to the dispersant demand of the particles to form a water dispersion wherein the dispersant demand is from 0.15 to 0.50 weight percent of the amount of particles and thereby maintaining said dispersion at a minimum viscosity;
   b. diluting said water dispersion with an aqueous medium until said particles comprise from 15 to 30% by weight of said dispersion;
   c. adding an anchoring agent to said dispersion; said anchoring agent comprising an organic vinyl monomer containing polar groups which are adsorbed on the surface of said particles; said anchoring agent being capable of polymerization with vinyl monomers;
   d. adding an organic vinyl monomer to said dispersion;
   e. polymerizing said monomer and said anchoring agent in the presence of a polymerization catalyst thereby coating said individual and discrete pigment particles with the formed organic polymers;
   f. and filtering and drying the product of step (e).

3,884,872
INORGANIC ZINC SALTS AS COLOR STABILIZERS FOR ACRYLONITRILE VINYL CHLORIDE DYESITE CONTAINING COPOLYMERS

Robert R. Falconio, Pottstown, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 7, 1973, Ser. No. 386,470
Int. Cl. C08f *45/56*
U.S. Cl. 260—45.75 W **12 Claims**

1. A color stabilized copolymer composition comprising, a copolymer having from about 20 to about 80 percent by weight of vinyl chloride and from about 80 to about 20 percent of acrylonitrile, said copolymer having from 0.01 to 10 percent by weight of a dye site, said dye site being an amine sulfonate salt of a sulfonic acid and a higher alkyl group containing primary, secondary or tertiary amino compounds and, said copolymer having from 0.01 to about 5 percent by weight of a color stabilizing inorganic zinc compound, said inorganic zinc compound selected from the group consisting of zinc oxide, zinc chloride, zinc carbonate and zinc sulfate.

3,884,873
ARYLENE SULFIDE POLYMER CURED WITH THE AID OF CERTAIN COMPOUNDS

James N. Short, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 29, 1973, Ser. No. 420,254
Int. Cl. C08f *45/58*
U.S. Cl. 260—45.85 B **8 Claims**

1. A composition of matter comprising an arylene sulfide polymer and an amount sufficient to reduce melt flow of said polymer of a compound selected from the group consisting of tetrakis[3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionyloxymethyl]methane, 1,3,5-trimethyl tris [3,5-di-tert-butyl-4-hydroxybenzyl]benzene, and octadecyl-3-(3′,5′-di-tert-butyl-4′-hydroxyphenyl)propionate.

3,884,874
DIACYL-HYDRAZINE STABILIZERS FOR POLYOLEFINS

Siegfried Rosenberger, Riehen, and Andreas Schmidt, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 16, 1972, Ser. No. 307,269
Claims priority, application Switzerland, Nov. 26, 1971, 17241/71
Int. Cl. C08f *45/60*
U.S. Cl. 260—45.85 B **13 Claims**

1. A composition of matter stabilised against thermo-oxidative degradation and discoloration which comprises a polyolefin and
   a. from 0.01 to 5 percent by weight of a compound A of the formula

$$R_1—CO—NHNH—CO—R_2$$

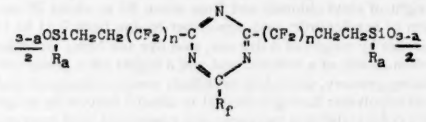
wherein
   R_1 and R_2 independently of one another denote the unsubstituted phenyl group, a phenyl group substituted by a hydroxyl group in the m- or p-position, by one or two alkyl groups each with 1 to 4 carbon atoms, by one or two alkenyl groups each with 3 or 4 carbon atoms, by one or two cycloalkyl groups with 6 to 8 carbon atoms, by 1 or 2 chlorine atoms, by one or two alkoxy groups each with 1 to 18 carbon atoms or by an acylamino group with 2 to 18 carbon atoms or by an amino group in the o-position, or where
   R_2 also denotes hydrogen, alkyl with 1 to 18 carbon atoms, cyclohexyl or benzyl if R_1 denotes a substituted phenyl group, and
   b. 0.3 percent by weight of an ester of β-thiodipropionic acid selected from the group consisting of dilauryl β-thiodipropionate and distearyl β-thiodipropionate.

3,884,875
FLUOROCARBON TRIAZINE COMPOUNDS

Yung Ki Kim, and Ogden R. Pierce, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 25,579, April 3, 1970, Pat. No. 3,847,916, which is a division of Ser. No. 733,833, June 3, 1968, Pat. No. 3,532,696. This application Apr. 1, 1974, Ser. No. 456,923
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 E 4 Claims

1. A siloxane having at least one unit of the formula



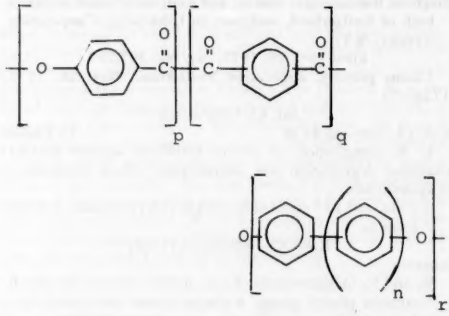
R_f is a polyfluorinated alkyl radical of no more than 12 carbon atoms,
R is a monovalent hydrocarbon radical or an ACH_2CH_2 radical in which A is a perfluoroalkyl radical;
n has a value of from 1 to 10 inclusive, and each
a independently has a value of from 0 to 2 inclusive; and remaining units being of the formula $Z_bSiO_{4-b/2}$ in which Z is a hydrocarbon or halohydrocarbon radical, a hydrogen atom, the hydroxyl group or a hydrolyzable group, and
b has a value of from 0 to 3 inclusive.

3,884,876
PARTIALLY CROSSLINKED LINEAR AROMATIC POLYESTERS

Steve G. Cottis, Amherst; James Economy, Eggertsville, and Arnold A. Wosilait, Grand Island, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Aug. 31, 1973, Ser. No. 393,705
Int. Cl. C08g *17/02*
U.S. Cl. 260—47 C 13 Claims

1. A moldable partially crosslinked polyester containing recurring moieties of the formula



wherein *n* is 0 or 1 and *p*, *q* and *r* are integers which total 30 to 600, wherein crosslinking is between susceptible moieties in the polymer chain and adjacent polymer chains of the same formula and is so limited as to make the crosslinked polymer produced thermoplastic and moldable while being sufficient to make it incapable of being melt drawn or spun to a fiber or deposited as a film, which crosslinking is that effected by heating a linear polyester of the formula given to an elevated temperature in the range of 250° to 500°C. in the presence of oxygen for a period of time long enough to make the polymer produced incapable of being fiber forming by drawing or spinning from a melt and incapable of being deposited as a film, while still retaining thermoplasticity and being moldable.

3,884,877
FLUOROELASTOMER COMPOSITIONS WITH TRIORGANOPHOSPHORUS OXIDE

Robert E. Kolb, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 16, 1973, Ser. No. 406,836
Int. Cl. C08f *29/16*, *45/72*
U.S. Cl. 260—47 UA 8 Claims

1. A curable fluoroelastomer composition comprising elastomeric copolymer of vinylidene fluoride and terminally ethylenically unsaturated fluorinated comonomer and for each hundred parts thereof:
a. 0.2 to 5 parts triorganophosphorus oxide
b. 0.1 to 5 parts quaternary phosphonium or ammonium compound
c. a total of 3 to 40 parts consisting of
i. 0 to 25 parts acid acceptor
ii. 0 to 25 parts optional base
d. 0.2 to 5 parts aromatic hydroxy or amino compound.

3,884,878
OXALYL CYANIDE

Donald R. Hariter, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 54,617, July 13, 1970, Pat. No. 3,763,161. This application Mar. 14, 1973, Ser. No. 341,248
Int. Cl. C07c *121/20*
U.S. Cl. 260—545 R 1 Claim

1. Oxalyl cyanide.

3,884,879
PERFLUOROALKYL-THIOETHER ALCOHOLS, ESTERS AND POLYMERS THEREOF

Edward Karl Kleiner, New York, and Martin Knell, Ossining, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 299,487, Oct. 20, 1972, Pat. No. 3,763,116, which is a continuation-in-part of Ser. No. 199,793, Nov. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 720,370, April 10, 1968. This application Apr. 30, 1973, Ser. No. 355,640
Int. Cl. C07c *149/18*
U.S. Cl. 260—609 R 8 Claims

1. A compound of the formula:
$R_fC_mH_{2m}SC_nH_{2n}OH$
wherein
m is 2 to 12,
n is 3 to 12,
R_f is $C_pF_{2p+1}OC_qF_{2q}$
p is 3 to 18, and
q is 2 to 8.

3,884,880
MODIFIED AMIDE-IMIDE RESINS AND METHOD OF MAKING THE SAME

Donny R. Disque, and Ernest C. Koerner, both of Fort Wayne, Ind., assignors to Phelps Dodge Magnet Wire Corporation, Fort Wayne, Ind.

Filed Sept. 21, 1973, Ser. No. 399,393
Int. Cl. C08q *22/04*
U.S. Cl. 260—77.5 AM 22 Claims

1. A composition of matter comprising the reaction product of aromatic tricarboxylic acid anhydride reactant and aromatic diisocyanate reactant and aliphatic dicarboxylic acid reactant having more than 6 carbon atoms reacted in a reaction solution comprising aprotic solvent having solvency parameters within the following ranges: δd 8.0 through 10.0, δp 1.5 through 4.5, δh 1.0 through 4.0 and said reactants at a temperature ranging from about 150°C. to about 200°C., said reactants being a major portion of said reaction solution, said dicarboxylic acid reactant being present in an amount which

is greater than about 10 mol percent and less than about 50 mol percent of said anhydride reactant.

3,884,881
PREPARATION OF POLY(P-PHENYLENE TEREPHTHALAMIDE) BY MIXING SOLUTION OF P-PHENYLENE DIAMINE WITH MOLTEN TEREPHTHALOYL CHLORIDE

Archie Robert Bice; James Allen Fitzgerald, both of Richmond, and Alan Ellsworth Hoover, Chesterfield County, all of Va., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed May 18, 1973, Ser. No. 361,818
Int. Cl. C08g *20/20*
U.S. Cl. 260—78 R **2 Claims**

1. In a process wherein a solution of p-phenylene diamine and hexamethylphosphoramide is mixed with molten terephthaloyl chloride and the resulting mixture is forwarded within one second to a first polymerizer where it is mixed with cooling to yield a partially polymerized product having a viscosity of from about 10 to 100 poises and a temperature of less than about 95°C. and said product is then passed to an externally cooled second polymerization chamber, the improvement comprising introducing said partially polymerized product into one end of said second polymerization chamber and forwarding it to the exit of the chamber while mixing and shearing it at a rate of at least 100 $sec.^{-1}$ as it passes through said polymerization chamber, recycling a portion of it as it flows towards the exit of the polymerization chamber in a plurality of zones along the flow path whereby the retention time of the recycled material in the polymerization chamber is increased beyond the time it would have remained in the chamber in the absence of recycling, and withdrawing a crumb-like product containing high molecular weight poly(p-phenylene terephthalamide) from the exit of the polymerization chamber, the said material stream being retained in the polymerization chamber for from 1 to 15 minutes and being uniformly cooled to result in an exit temperature between about 40°C. and 95°C.

3,884,882
CERTAIN EPDM COPOLYMER/MALEIC ANHYDRIDE ADDUCTS AND THERMOPLASTIC ELASTOMERS THEREFROM

Stanley William Caywood, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Jan. 10, 1973, Ser. No. 322,360
Int. Cl. C08f *15/40, 27/04*
U.S. Cl. 260—78.4 D **22 Claims**

1. An adduct of maleic anhydride and an elastomeric copolymer of ethylene, at least one C_3 to C_6 α-olefin, and at least one nonconjugated diene; the adduct having an inherent viscosity of at least one as measured on 0.1 gram of adduct dissolved in 100 milliliters of perchloroethylene at 30°C. and having a gel content less than about 5 percent as measured by weight percent adduct insoluble in boiling tetrahydrofuran at atmospheric pressure after 48 hours.

22. A method of preparing a thermoplastic elastomer, said method comprising the following steps:

1. mixing
   A. an adduct of maleic anhydride with an ethylene/-propylene/1,4-hexadiene terpolymer, the proportion of maleic anhydride being about 1-4 weight percent of the adduct; the gel content of the adduct being less than about 2 weight percent as measured by the proportion of adduct insoluble in boiling tetrahydrofuran at atmospheric pressure for 48 hours; and the inherent viscosity of the adduct being at least 1 as measured on 0.1 gram of adduct dissolved in 100 ml. of perchloroethylene at 30°C.; and
   B. an amount of at least one zinc salt selected from the group consisting of zinc acetate dihydrate, hydrated zinc acetylacetone, and hydrated zinc catecholate effective to cure the adduct;
2. exposing the resulting mixture to at least one accelerator selected from the group consisting of water, mercaptans, phenols, organic acids, alcohols, and amines; and
3. heating the exposed mixture for a sufficient time to cure the adduct.

3,884,883
ARYLENE SULFIDE POLYMERS

Charles W. Moberly, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 19, 1973, Ser. No. 416,823
Int. Cl. C08g *23/00*
U.S. Cl. 260—79.1 **14 Claims**

1. A method of producing a polymer which comprises:
   a. forming a composition by contacting at least one polyhalo-substituted aromatic compound wherein the halogen atoms are attached to aromatic ring carbon atoms, at least one base selected from the hydroxides of lithium, sodium, potassium, rubidium, cesium, magnesium, calcium, strontium and barium and the carbonates of sodium, potassium, rubidium and cesium, at least one organic amide and at least one thiocarbonate having the formula

$$\begin{matrix} & X & \\ & \| & \\ RXCXR, & & \end{matrix}$$

wherein each R is an alkali metal or a monovalent hydrocarbyl radical selected from alkyl, cycloalkyl and aryl and combinations of said radicals, the number of carbon atoms in said hydrocarbyl radical being within the range of one to about 12, at least one R being said monovalent hydrocarbyl radical, and X is oxygen or sulfur, at least one X being oxygen and at least one X being sulfur; and,
   b. maintaining at least a portion of said composition at polymerization conditions to produce said polymer.

3,884,884
ARYLENE SULFIDE POLYMERS

Lacey E. Scoggins, and Robert W. Campbell, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Ohio

Filed Nov. 20, 1973, Ser. No. 417,581
Int. Cl. C08g *23/00*
U.S. Cl. 260—79.1 **11 Claims**

1. A method of producing a polymer which comprises:
contacting at least one polyhalo-substituted aromatic compound in which the halogen atoms are attached to aromatic ring carbon atoms, at least one alkali metal aminoalkanoate having the formula $R_2N(CR_2)_nCO_2M$ wherein each R is selected from the group consisting of hydrogen and hydrocarbyl radicals selected from alkyl, cycloalkyl and aryl radicals and combinations of said radicals, the number of carbon atoms in each of said radicals being within the range of one to about 12, M is an alkali metal selected from lithium, sodium, potassium, rubidium, and cesium, n is an integer having a value of 1 to about 12, and the total number of carbon atoms in each molecule of the alkali metal aminoalkanoate is within the range of two to about 24 and at least one sulfur source selected from the group consisting of (a) elemental sulfur; (b) hydrogen sulfide; (c) carbon disulfide; (d) carbon oxysulfide; (e) phosphorus pentasulfide; (f) thiosulfates selected from lithium, sodium, potassium, rubidium, cesium, magnesium, calcium, strontium, and barium thiosulfates; (g) thiocarboxylates and thiocarboxylic acids having the formula

$R[CXS(M/y)]_n$

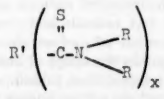
wherein R is a hydrocarbon radical having 1 to about 20 carbon atoms and a valence of n, n is an integer having a value within the range of 1 to 4, each X is selected from oxygen and sulfur, each M is hydrogen or a metal selected from the group consisting of lithium, sodium, potassium, rubidium, cesium, magnesium, calcium, strontium, and barium and y is equal to the valence of M; (h) thiocarbonates having the formula

wherein each R is an alkali metal or a monovalent hydrocarbyl radical selected from alkyl, cycloalkyl and aryl radicals and combinations of said radicals, the number of carbon atoms in said hydrocarbyl radical being within the range of one to about 12, at least one R being a monovalent hydrocarbyl radical, and X is selected from oxygen and sulfur, at least one X being oxygen and at least one X being sulfur; (i) thiocarbamates represented by the formula

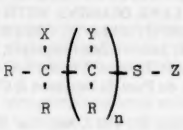
wherein each R is selected from hydrogen and R'', R' is selected from alkali metals and R'', R'' is a monovalent hydrocarbyl radical selected from alkyl, cycloalkyl and aryl radicals and combinations of said radicals, the number of carbon atoms in said hydrocarbyl radical being within the range of one to about 12 and each X is selected from oxygen and sulfur, at least one X being sulfur; (j) trithiocarbonates represented by the formula

wherein R is an alkali metal or a monovalent hydrocarbyl radical selected from alkyl, cycloalkyl and aryl radicals and combinations of said radicals, the number of carbon atoms in said hydrocarbyl radical being within the range of one to about 12; (k) thioureas having the formula

wherein R is selected from the group consisting of hydrogen and alkyl, cycloalkyl and aryl radicals and combinations of said radicals, the number of carbon atoms in each R group being within the range of 0 to about 12; (l) thioamides having the formula

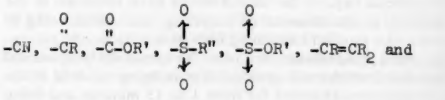


wherein each R is selected from the group consisting of hydrogen and alkyl, cycloalkyl and aryl radicals and combinations of said radicals, R' is selected from the group consisting of hydrogen and hydrocarbon radicals of valence x selected from saturated hydrocarbon radicals, aromatic hydrocarbon radicals and combinations of said radicals and x is an integer having a value of 1 to 4, with the proviso that when $x = 1$, R' and one R, together, can represent a divalent hydrocarbon radical selected from the group consisting of unsubstituted and alkyl-substituted, cycloalkyl-substituted, and aryl-substituted alkylene, cycloalkylene and arylene radicals, the total number of carbon atoms in said thioamide being with the range of one to about 20; and (m) mercaptans, mercaptides and sulfides having an alpha and/or beta activating substituent and represented by the formula

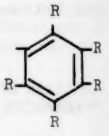


wherein each R is selected from hydrogen and monovalent hydrocarbon radicals selected from alkyl, cycloalkyl and aryl radicals and combinations of said radicals having one to about 16 carbon atoms, n is 0 or 1, X and Y are each selected from R and Q, at least one of X and Y being Q, with the proviso that when n is 0, X is Q, and when n is 1 and Y is R, at least one R attached to

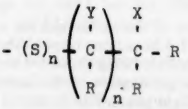
is hydrogen, Q is an activating substituent selected from



and



R' is selected from monovalent hydrocarbon radicals selected from alkyl, cycloalkyl and aryl radicals and combinations of said radicals, having one to about 16 carbon atoms, and M/y, where M is a metal selected from lithium, sodium, potassium, rubidium, cesium, magnesium, calcium, strontium, and barium and y is the valence of the metal M, R'' is selected from monovalent hydrocarbon radicals selected from alkyl, cycloalkyl and aryl radicals and combinations of said radicals having one to about 16 carbon atoms, Z is selected from hydrogen, M/y and



and the total number of carbon atoms in each molecule is within the range of one to about 40, under polymerization conditions to produce said polymer.

3,884,885
MELT PROCESSING OF FLUORINATED POLYMERS

Walther Gustav Grot, Chadds Ford, Pa., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Aug. 1, 1973, Ser. No. 384,502
Int. Cl. C07c *143/68*; C08f *15/02*
U.S. Cl. 260—79.3 R 19 Claims

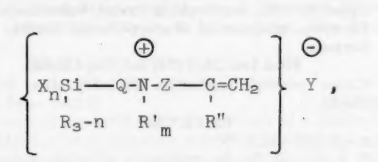
1. A method for treating a fluorinated polymer which degrades prior to melting, said polymer containing pendant side chains with sulfonyl groups which are attached to carbon atoms which have at least one fluorine atom attached thereto, said sulfonyl groups in the form of $-SO_3H$, salt thereof, or salt of $-SO_2NH_2$, which method comprises contacting said polymer with a tertiary amine, quaternary ammonium base or the salt of said amine or base with the proviso that when said pendant side chain is in the form $-SO_3Y$ with Y an alkali metal, the salt of the tertiary amine, the quaternary ammonium base or salt thereof is employed; and melt processing the contacted polymer.

3,884,886
CATIONIC UNSATURATED AMINE-FUNCTIONAL SILANE COUPLING AGENTS

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 323,595, Jan. 15, 1973, Pat. No. 3,819,675, which is a division of Ser. No. 99,228, Dec. 17, 1970, Pat. No. 3,734,763, which is a continuation-in-part of Ser. No. 825,035, May 15, 1969, abandoned. This application Apr. 4, 1974, Ser. No. 457,943
Int. Cl. C08f *3/16*, *11/04*
U.S. Cl. 260—80 PS 7 Claims

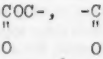
1. A vinylic copolymer formed by addition polymerization of from 0.5 to 5 mol percent of



hydrolyzates and partial condensates thereof, in which
X is the hydroxyl group or a hydrolyzable radical;
R is a lower alkyl radical;
n is an integer having a value of from 1 to 3 inclusive;
Q is a divalent hydrocarbon radical or a divalent hydrocarbon radical containing oxygen in the form of

groups or nitrogen in the form of

groups;
R′ is independently selected from the group consisting of the hydrogen atom, a lower alkyl radical or a heterocyclic organic compound containing the nitrogen atom as a ring member;
m is an integer of 1 or 2;
Z is a divalent organic radical having a double bond conjugated with the



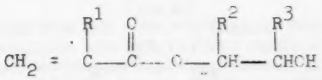
moiety, Z being bonded to the nitrogen atom by a C–N bond;
R″ is the hydrogen atom or a lower alkyl radical; and
Y is an acid anion,
with from 95 to 99.5 mol percent of a vinylic organic monomer.

3,884,887
VINYL COPOLYMERS AND PROCESSES FOR MAKING THEM

Donald R. Montgomery, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 200,569, Nov. 19, 1971, Pat. No. 3,755,271. This application July 26, 1972, Ser. No. 275,356
Int. Cl. C08f *15/40*
U.S. Cl. 260—80.75 3 Claims

1. An uniformly random copolymer having a mer content of about 70 to 90 weight per cent vinyl chloride derived mers, based in weight of the copolymer, about 10 to 30 weight per cent based on the weight of the copolymer, of an ester derived mers having the formula:



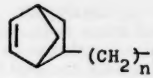
wherein R^1, R^2 and R^3 are each one of hydrogen or methyl, and up to about 15 weight percent, based on the weight of the copolymer, of an alkyl ester of an alpha, beta-ethylenically unsaturated acid or a vinyl ester of a saturated carboxylic acid derived mers, which copolymer has an inherent viscosity of about 0.2 to about 0.5, determined at 30°C using 0.2 grams of the copolymer in a deciliter of cyclohexanone, and a ratio of weight average to number average molecular weight of not greater than about 2.

3,884,888
FUNCTIONALLY SUBSTITUTED TERPOLYMERS AND TETRAPOLYMERS OF α-OLEFINS AND PROCESS FOR MANUFACTURING FUNCTIONAL SUBSTITUTED COPOLYMERS

John Wilfred Collette; Rolland Shih-Yuan Ro, and Fred Max Sonnenberg, all of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 829,758, June 2, 1969, Pat. No. 3,748,316. This application Apr. 27, 1973, Ser. No. 355,084
Int. Cl. C08f *3/86*, *1/28*, *15/40*, *27/10*
U.S. Cl. 260—80.78 3 Claims

1. An addition copolymer of (1) ethylene, (2) propylene, (3) nonconjugated diene, and (4) an unsaturated functional monomer from the group represented by the following formula



where n is an integer within the range 0–20 and Z is a functional group selected from the following: $-NH_2$,

$$-CO_2H,\ -C\overset{O}{\overset{\|}{N}}H_2,\ \text{and}\ -CN.$$

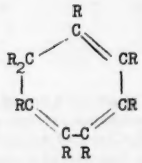
3,884,889

CYCLIC TRIENE COUPLING AGENTS

Henry L. Hsieh, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 1, 1973, Ser. No. 366,244
Int. Cl. C08d 1/20, 1/36
U.S. Cl. 260—83.7 6 Claims

1. In a process for the production of rubbery conjugated diene polymers having a tendency to cold flow by polymerizing a conjugated diene having from 4 to 12 carbon atoms per molecule in the presence of a hydrocarbon lithium initiator, the improvement for increasing the Mooney viscosity, inherent viscosity, molecular weight values, processability, as well as reducing cold flow of such polymers which improvement comprises carrying out said polymerizing in the presence of a 1,3,5-cycloheptatriene coupling agent having the formula



wherein R is hydrogen or alkyl such that the total number of carbon atoms in the molecule will not exceed about 16 in an amount sufficient to reduce the cold flow without gel formation of the resulting polymer, as well as improving said other physical properties of the polymer.

3,884,890

PREPARATION OF TRANSPARENT AND THERMOSTABLE COPOLYMERS

Johannes T. Van Oosterhout, Leersum, Netherlands, assignor to Stamicarbon, N.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 55,969, July 17, 1970, abandoned, which is a continuation-in-part of Ser. No. 810,820, March 26, 1969, abandoned. This application Sept. 15, 1971, Ser. No. 180,901
Claims priority, application Netherlands, Mar. 28, 1968, 6804333
Int. Cl. C08f 1/11, 15/02
U.S. Cl. 260—87.5 C 7 Claims

1. Process for preparing thermostable copolymers of a vinyl halide and 4-methyl pentene-1 having a melt index not exceeding about 100 comprising copolymerizing under oxygen-free conditions a vinyl halide and 4-methyl pentene-1 in a ratio such that the resulting copolymer contains from 0.1 to 9% by weight of 4-methyl pentene-1, at a pressure below about 15 atm, at a temperature between −50° C and +80° C and in the presence of a polymerization initiator of a compound soluble in the monomers and producing free radicals.

3,884,891

METHOD FOR PREPARING BRANCHED COPOLYMERS BY ETHYLENE WITH UNSATURATED SILICONE MONOMERS

Sergei Mikhailovich Samoilov, Simonovsky val 8, kv. 60; Viktor Nikolaevich Monastyrsky, ulitsa Vasilievskaya, 9, kv. 62, both of Moscow; Svetlana Tikhonovna Pudovik, ulitsa Kutuya, 14, kv. 83, and Evgeny Vasilievich Kuznetsov, ulitsa Karla Marxa, 72, kv. 10, both of Kazan, all of U.S.S.R.

Filed July 17, 1972, Ser. No. 272,661
Int. Cl. C08f 15/02
U.S. Cl. 260—88.1 R 13 Claims

1. Branched copolymers consisting essentially of ethylene and 0.2-40 mole per cent unsaturated silicon monomers having the formula $R^1CH{=}CHSiR_m^2R_n^3(OR^4)_p$, where R^1 is selected from the group consisting of H and saturated C_1–C_{20} aliphatic radicals; R^2 is a C_1–C_{20} saturated aliphatic radical; R_3 is phenyl; R^4 is a radical selected from the group consisting of C_1–C_{20} saturated aliphatic radicals and aryl radicals having no more than two aromatic rings; m is from 0 to 2, when R^1 is H, and from 1 to 3 when R^1 is a saturated aliphatic radical; n is from 0 to 3; p is from 0 to 2; and $m+n+p=3$; said copolymers containing links expressed by the formula (—CH$_2$—CH$_2$—) and (—R^1CH— CHSi$R_m^2R_n^3$(OR^4)p—).

3,884,892

METHOD FOR THE PRODUCTION OF POLYVINYL ALCOHOL

Heinz Winkler; Eduard Bergmeister, both of Burghausen, Upper Bavaria, and Siegfried Strebel, Raitenhaslach, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Jan. 28, 1974, Ser. No. 436,964
Claims priority, application Germany, Jan. 31, 1973, 2304684
Int. Cl. C08f 27/16
U.S. Cl. 260—91.3 PV 10 Claims

1. A process for the production of polyvinyl alcohol by catalytic alcoholysis of its esters comprising the steps of charging into a confined space an alcoholic polyvinyl ester solution of a relatively high viscosity and a specific gravity of over 0.9 measured at 20°C, disposing a layer of one or more alcohols having a specific gravity of below 0.84 on top of said alcoholic ester solution, disposing a layer of a liquid alcoholysis catalyst solution in an alcohol having a specific gravity of at leat 0.1 higher than the specific gravity of said alcohols layer below said alcohols layer, where the alcohols employed are alkanols having 1 to 4 carbon atoms, stirring said reactants whereby a suspension of said polyvinyl ester solution in droplet form in said alcoholic layer is formed, for a time sufficient to effect alcoholysis, and recovering polyvinyl alcohol.

3,884,893

CHLORINATED POLYPENTENAMER

Günter Kolb, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 22, 1970, Ser. No. 100,814
Claims priority, application Germany, Jan. 10, 1970, 2000955
Int. Cl. C08f 5/00, 27/02
U.S. Cl. 260—93.1 1 Claim

1. chlorinated polypentenamers having a chlorine content of 60 to 70 percent by weight.

3,884,894
OLEFIN POLYMERIZATION

Allan John Amass, Southampton; Anthony Vincent Butcher, New Milton; Edward William Duck, Southampton, and John Michael Locke, Lyndhurst, all of England, assignors to The International Synthetic Rubber Co., Ltd., England

Filed Feb. 26, 1973, Ser. No. 336,041

Claims priority, application United Kingdom, Mar. 3, 1972, 10188/72; Jan. 11, 1973, 1601/73

Int. Cl. C08f *3/02*

U.S. Cl. 260—93.7 **17 Claims**

1. A process for the preparation of a homopolymer of propylene wherein the polymerization is effected in a hydrocarbon diluent by means of a catalyst comprising:

1. An intimate dispersion of:

A. titanium trichloride, and

B. a compound of a transition metal selected from the group consisting of vanadium oxytrichloride, vanadium tetrachloride, vanadyl acetyl acetonate, niobium pentachloride and molybdenum oxytetrachloride in which the mole ratio of component A to component B is in the range 10:1 to 100:1, said intimate dispersion 1 having been prepared by ball milling for at least 2 hours component A with component B and

2. An aluminum compound selected from the group consisting of an aluminum hydrocarbyl, an aluminum hydrocarbyl halide and a mixture thereof; and recovering the polypropylene.

3,884,895
BONDING EPDM RUBBER TO GENERAL PURPOSE BUTADIENE POLYMER RUBBER

Charles F. Eckert, Wayne, and Norman J. Pinkowski, Bloomfield, both of N.J., assignors to Uniroyal, Inc., New York, N.Y.

Filed Apr. 27, 1970, Ser. No. 32,425

Int. Cl. C08d *3/08, 13/20, 9/00*

U.S. Cl. 260—94.2 R **5 Claims**

1. A bonding cement consisting essentially of a solution of compounded polybutadiene in a volatile organic solvent, said polybutadiene having a cis content of 10% to 25%, a trans content of from 40% to 70%, a vinyl content of from 17% to 35%, and a combined trans and vinyl content at least equal to 70%, said percentages being by weight, and an intrinsic viscosity greater than 2, said cement comprising compounding and vulcanizing ingredients capable of effecting vulcanization of said polybutadiene.

3,884,896
NEW SUBSTRATES FOR DIAGNOSTIC USE, WITH HIGH SUSCEPTIBILITY TO THROMBIN AND OTHER PROTEOLYTIC

Gustaf Erik Birger Blomback; Margareta Blomback, both of Solna; Karl Goran Claeson, and Lars-Gundro Svendsen, both of Goteborg, all of Sweden, assignors to AB Bofors, Bofors, Sweden

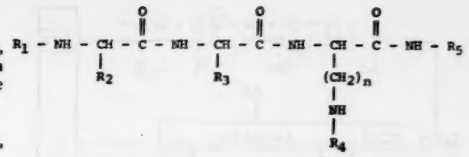
Filed Apr. 24, 1973, Ser. No. 354,036

Claims priority, application Sweden, May 2, 1972, 5757/72

Int. Cl. C07c *105/52;* **C07g** *7/00;* **A61k** *27/00*

U.S. Cl. 260—112.5 **21 Claims**

1. Substrate with high susceptibility to proteolytic enzymes of the type peptide peptidohydrolases, which substrate is represented by the formula:



or acid addition salts thereof, where R_1 is selected from the group consisting of hydrogen, an alkyl-carbonyl having 1 –12 carbon atoms, a ω-aminoalkyl-carbonyl having 1–12 carbon atoms in a straight chain, cyclohexyl-carbonyl, a ω-cyclohexyl-alkyl-carbonyl having 1–6 carbon atoms in a straight chain, 4-aminoethyl-cyclohexylcarbonyl, benzoyl, benzoyl substituted with at least one substituent selected from the group consisting of halogen atoms, methyl, amino and phenyl, a ω-phenyl-alkyl-carbonyl having 1–6 carbon atoms in a straight chain, benzenesulphonyl, 4-toluenesulphonyl and N benzoyl-phenylalanyl; R_2 is selected from the group consisting of phenyl, benzyl, 4-hydroxybenzyl, 4-methoxybenzyl and 4-methylbenzyl; R_3 is selected from the group consisting of a straight, branched or cyclic alkyl having 3–8 carbon atoms, phenyl and benzyl; *n* is selected from the group consisting of 3 and 4; R_4 is selected from the group consisting of hydrogen and quanyl; R_5 is selected from the group consisting of phenyl, nitrophenyl, methylnitrophenyl, naphthyl, nitronaphthyl, quinolyl and nitroquinolyl.

3,884,897
PROCESS FOR THE MANUFACTURE OF INSULIN, ANALOGS AND DERIVATIVES THEREOF

Rolf Geiger, Frankfurt am Main; Hans Wissmann, Bad Soden, Taunus, and Dietrich Langner, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

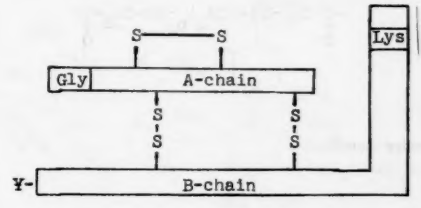
Filed Oct. 29, 1973, Ser. No. 410,312

Claims priority, application Germany, Oct. 31, 1972, 2253297

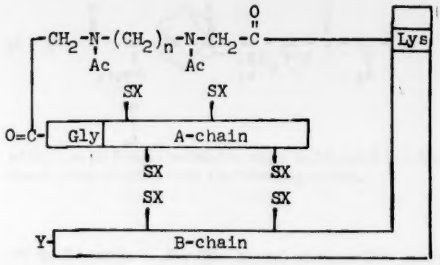
Int. Cl. C07c *103/52;* **C08h** *1/00*

U.S. Cl. 260—112.7 **2 Claims**

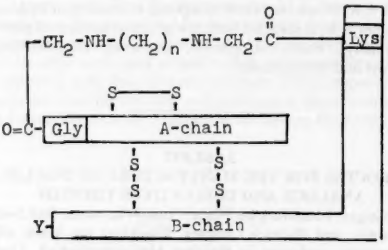
1. A method for making an insulin compound of the formula



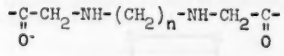
wherein Y is hydrogen, alkanoyl having 1 to 4 carbon atoms, phenyl-alkanoyl having 1 to 3 carbon atoms in the alkanoyl portion, benzoyl, alkyloxy-carbonyl or aralkyloxy-carbonyl having 1 to 4 carbon atoms in the alkyl portion, or aminoacyl derived from a naturally-occurring α-or β- amino acid or from the D-enantiomer thereof, and biologically-active analogs thereof in which one or more amino acids have been exchanged for other, preferably simpler, amino acids or in which the chains are modified, preferably shortened, in length, which process comprises cleaving N-protective and S-protective groups from a compound of the formula



or analogs thereof in which one or more amino acids have been exchanged for other, preferably simpler, amino acids or in which the chains are modified, preferably shortened, in length wherein Ac is an N-protective group cleaved by proton solvolysis, X is hydrogen or an S-protective group, and *n* is 2 or 3, dehydrogenating -SH groups in the resultant product to form S-S bonds, whereby a compound of the formula



or an aforementioned analog thereof, is obtained, and then subjecting the last-mentioned compound or analog to Edman degradation to remove the



bridge therefrom.

3,884,898

NORMORPHINE DERIVATIVES BONDED TO PROTEINS

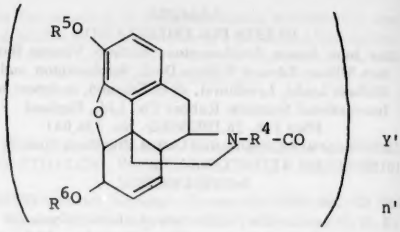
Richard S. Schneider, Sunnyvale, Calif., assignor to Syva Company, Palo Alto, Calif.

Filed Aug. 18, 1972, Ser. No. 281,883

Int. Cl. C07g *7/00;* **G01n** *27/78, 33/16*

U.S. Cl. 260—121 **4 Claims**

1. A normorphine derivative of the formula:



wherein R^4 is aliylene of from 1–6 carbon atoms;

R^5 and R^6 are hydrogen or acyl of from 1–2 carbon atoms;

Y′ is an antigenic polypeptide residue; and

n′ is from 1 to 250;

wherein said polypeptide residue is bonded through amide linkages.

3,884,899

WATER SOLUBLE QUATERNIZED BENZTHIAZOLE PHENYLAZOPYRIDINE DYESTUFFS

John Lindley Leng, and David Frederick Newton, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

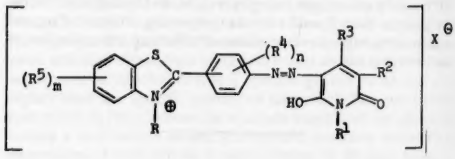
Filed Apr. 9, 1973, Ser. No. 349,191

Claims priority, application United Kingdom, Apr. 17, 1972, 17583/72

Int. Cl. C09c *29/36*

U.S. Cl. 260—146 R **3 Claims**

1. Water-soluble azo dyestuff devoid of carboxylic acid or sulphonic acid groups of the formula



wherein

R represents methyl, ethyl, benzyl or carbonamidoethyl,

R^1 represents hydrogen, amino, methyl, ethyl, propyl, butyl, hydroxyethyl, aminoethyl, benzyl, naphthyl, phenyl, chlorophenyl, tolyl, nitrophenyl or methoxy phenyl,

R^2 represents hydrogen, cyano, methyl, chloro, amino, acetylamino, carboethoxy or carbonamido,

R^3 represents hydrogen, methyl, ethyl or phenyl, or R^2 and R^3 taken together with the carbon atoms to which they are attached form a benzene ring,

R^4 represents hydrogen, methyl, chloro or methoxy,

R^5 represents hydrogen, methyl, chloro, methoxy or ethoxy,

X represents an anion, and

m and n are integers from 1-3.

3,884,900

SUBSTITUTED 4-(2-NITRO-4-PHENOXY-SULFONYLANILINO)PHENYLAZOPYRAZOLES

Ruedi Altermatt, Buckten, Basel-Land, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

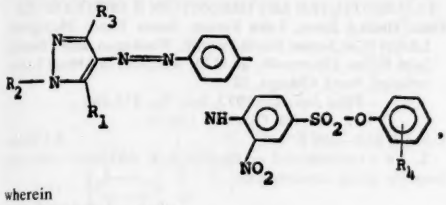
Continuation-in-part of Ser. No. 74,924, Sept. 23, 1970, Pat. No. 3,741,954. This application May 30, 1973, Ser. No. 365,107

Claims priority, application Switzerland, Oct. 21, 1969, 15709/69; May 16, 1973, 6967/73

Int. Cl. C09b 29/38; D06p 3/54

U.S. Cl. 260—162 13 Claims

1. A compound of the formula



wherein

R_1 is hydroxy or amino,

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms, cyclohexyl, phenyl, tolyl or benzyl,

R_3 is hydrogen, methyl, carbamoyl, methoxycarbonyl or ethoxycarbonyl, and

R_4 is hydrogen, methyl or methoxy.

3,884,901

O-(BENZYL OR BENZOYL)-BENZOIC ACID-AZO-PHENYL COMPOUNDS

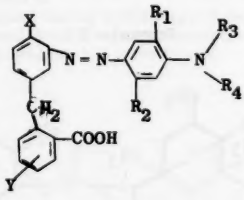
Edgar Earl Renfrew, and Dominic Andrew Zanella, both of Lock Haven, Pa., assignors to American Aniline Products, Incorporated, Paterson, N.J.

Filed Apr. 6, 1972, Ser. No. 241,810

Int. Cl. C09b 29/08, 29/26; D06p 1/06

U.S. Cl. 260—207 5 Claims

1. A compound of the formula

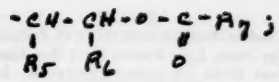


wherein

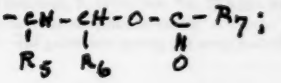
R_1 is hydrogen, chlorine, bromine, lower alkyl, or lower alkoxy;

R_2 is hydrogen, chlorine, bromine, lower alkyl, lower alkoxy, R_7CONH- or R_7SO_2NH-;

R_3 is hydrogen, lower alkyl, hydroxy(lower alkyl), lower alkoxy(lower alkyl), cyano(lower alkyl), chloro(lower alkyl), bromo(lower alkyl), or



R_4 is hydrogen, lower alkyl, hydroxy(lower alkyl), lower alkoxy(lower alkyl), cyano(lower alkyl), chloro(lower alkyl), bromo(lower alkyl), benzyl, chlorobenzyl, bromobenzyl, nitrobenzyl or



one of R_5 and R_6 is hydrogen or methyl; and the other of R_5 and R_6 is hydrogen:

each R_7 is independently lower alkyl, chloro(lower alkyl), bromo(lower alkyl), cyano(lower alkyl), phenyl, chlorophenyl, bromophenyl, lower alkylphenyl, lower alkoxyphenyl or cyanophenyl;

X is hydrogen, chlorine, bromine, lower alkyl, lower alkoxy, hydroxy(lower alkyl) or lower alkoxy(lower alkoxy); and Y is hydrogen, chlorine, or bromine.

3,884,902

SULFONYL DERIVATIVES OF ERYTHROMYCIN

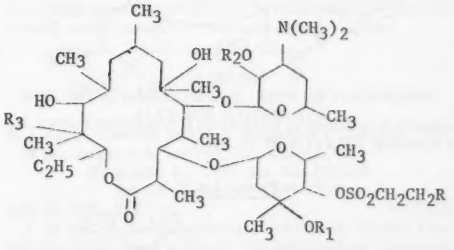
Robert Hallas; Jerry Roy Martin, both of Waukegan, and John Soloman, Chicago, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed May 4, 1973, Ser. No. 357,124

Int. Cl. C07c 129/18

U.S. Cl. 260—210 E 24 Claims

1. An erthromycin compound having the formula:



where R contains at least one alkyl group containing 1–6 carbon atoms and is selected from the group consisting of amino, mono, alkyl amino, dialkyl amino, alkoxy, morpholino, piperazino, piperidino, alkylthio, alkylsulfonyl, phenylthio, phenylsulfonyl thiamorpholino, aziridino, benzylthio, thiamorpholinosulfone, benzylsulfinyl, phenylsulfinyl, benzylsulfonyl, chloroalkyl, fluoroalkyl, cyanoalkyl, chlorocyanoalkyl, fluorocyanoalkyl, benzylamino, benzoxy, and benzylcyano; R_1 is methyl, R_2 is hydrogen or loweralkanoyl, and R_3 is hydrogen or hydroxy.

3,884,903

4''-DEOXY-4''-OXOERYTHROMYCIN B DERIVATIVES

Peter Hadley Jones, Lake Forest; Jerry Roy Martin, Waukegan; James Bruce McAlpine, Libertyville; Jeanne Marie Pauvlik, Chicago, and John Soloman Tadanier, Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

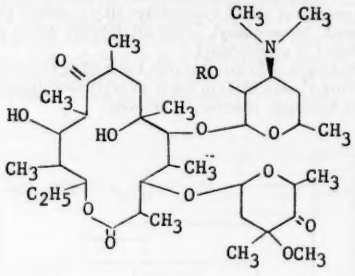
Continuation-in-part of Ser. No. 372,387, June 21, 1973, Pat. No. 3,842,069. This application Sept. 9, 1974, Ser. No. 504,417

Int. Cl. C07c *129/18*

U.S. Cl. 260—210 E 8 Claims

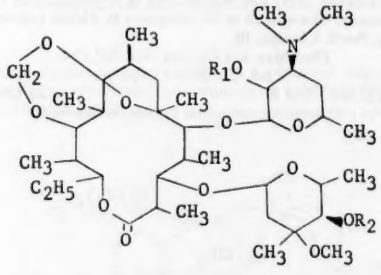
1. A 4''-deoxy-4''-oxoerythromycin derivative having a formula selected from the group consisting of:

Formula III



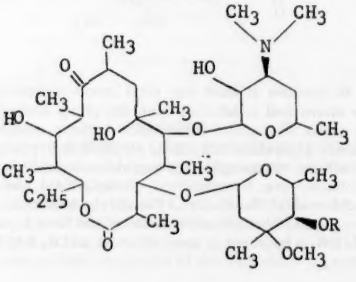
where R is hydrogen or CH_3CO;

Formula IV



where R_1 is hydrogen or RCO where R is as before defined, R_2 is hydrogen, CH_3CO or RCO; and

Formula V



where R_3 is H or RCO where R is as before defined.

3,884,904

11-SUBSTITUTED ERYTHROMYCIN B DERIVATIVES

Peter Hadley Jones, Lake Forest; James Bruce McAlpine, Libertyville; Jeanne Marie Pauvlik, Waukegan, and Thomas John Perun, Libertyville, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

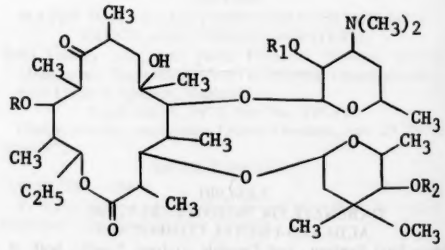
Filed June 21, 1973, Ser. No. 372,386

Int. Cl. C07c *129/18*

U.S. Cl. 260—210 E 5 Claims

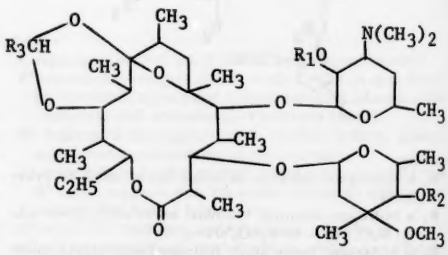
1. An 11-substituted erythromycin B derivative selected from the group consisting of:

Formula I



where R is selected from the group consisting of lower alkyl, CH_2SCH_3 CH_3SCH_2, $CH_3CH_2CH_2CH_2$ and $—CHR_3SR_4$ where R_3 and R_4 are lower alkyl, and R_1 and R_2 are hydrogen or lower alkanoyl and;

Formula II



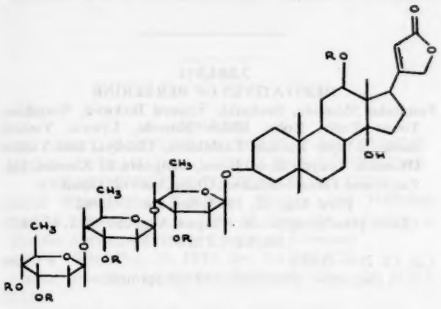
where R_1, R_2 and R_3 are as before defined.

3,884,905
PRO-DRUG FORMS OF DIGOXIN

Nicolae S. Bodor, Lawrence, Kans., assignor to INREX Research Corporation, Lawrence, Kans.

Filed May 2, 1974, Ser. No. 466,241
Int. Cl.[2] C07C *173/02*
U.S. Cl. 260—210.5 7 Claims

1. A digoxin compound of the formula:



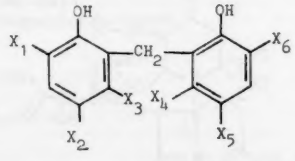
wherein R represents a member selected from the group consisting of a hydrogen atom, picolinoly, nicotinoyl, and iso-nicotinoyl, with the proviso that at least one of said R must represent a member selected from the group consisting of picolinoyl, nicotinoyl, or iso-nicotinoyl, and wherein, when R is other than hydrogen, all of said R's must be picolinoyl, nicotinoyl or iso-nicotinoyl.

3,884,906
2,2-METHYLENDEIPHENOLS PROCESSES OF PREPARING THE SAME, AND METHODS OF TREATING THEREWITH MAMMALS INFECTED WITH INTERNAL PARASITES

Samuel Van der Meer, Amstelveen, and Hendrikus Matheus van Alphen, Purmerand, both of Netherlands, assignors to ACF Chemiefarma N.V., Maarssen, Netherlands

Filed Mar. 29, 1972, Ser. No. 239,341
Claims priority, application Netherlands, Apr. 9, 1971, 7104839
Int. Cl. C07c *39/12*
U.S. Cl. 260—211 R 12 Claims

1. A compound having activity against fascioliasis and which is selected from the group consisting of substituted 2,2'-methylenediphenols having the formula

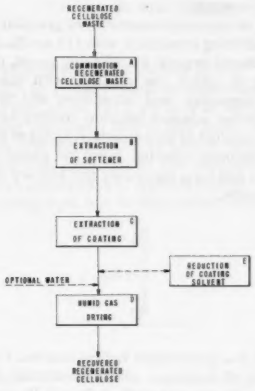


in which X_1 and X_5 are each selected from the group consisting of halogen and a nitro group, X_2 is a halogen atom, X_3 and X_4 are each selected from the group consisting of halogen and hydrogen, and X_6 is selected from the group consisting of halogen, hydrogen and a nitro group, and further in which at least one of X_1, X_5 and X_6 represents a nitro group and, in the event that each of X_1 and X_6 represents a nitro group, X_3 represents halogen and their salts with alkali metals or methyl and ethyl glucamines.

3,884,907
REGENERATED CELLULOSE RECOVERY PROCESS USING A HUMID GAS TO REMOVE COATING SOLVENT

Dale Roderic Laurance; Richard Dale Roe, and Robert Gene Sheppard, all of Lawrence, Kans., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Sept. 5, 1974, Ser. No. 503,501
Int. Cl. B29h *19/00*
U.S. Cl. 260—212 21 Claims



1. In a regenerated cellulose recovery process wherein (1) coated, softened, regenerated cellulose is comminuted, (2) the softener is removed leaving coated regenerated cellulose having open internal pores, (3) the coating is removed from the regenerated cellulose by flushing with a coating solvent, and (4) the regenerated cellulose is dried of coating solvent, the improvement wherein the regenerated cellulose is dried of coating solvent by contacting the regenerated cellulose having a solvent content of at least about 6 percent by weight at an elevated temperature with a gas stream containing an effective amount of water vapor to raise the regenerated cellulose water content to about 7 to 22 percent by weight and to reduce the coating solvent content of the regenerated cellulose.

3,884,908
STRONG ACID NEUTRALIZATION OF POLYMERIC ALCOHOL XANTHATES

N. I. Burke, Danville, and D. J. Bridgeford, Champaign, both of Ill., assignors to Tee-Pak, Inc., Chicago, Ill.

Filed Mar. 14, 1973, Ser. No. 340,988
Int. Cl. C08b *9/00*; C08f *27/06*
U.S. Cl. 260—218 9 Claims

1. A process for neutralizing a solid finely divided film-forming alkali metal polymeric alcohol xanthate containing free alkali and alkaline by-products, to form a neutral stable solid product in finely divided form which comprises:

adding, in small increments, a substantially stoichiometric quantity of strong acid based on the free alkali and alkaline by-product content in said xanthate to a liquid slurry of said finely divided alkali metal polymeric alcohol xanthate containing free alkali and alkaline by-products in an inert liquid vehicle in which the xanthate is substantially insoluble, and

intimately mixing said acid and xanthate slurry at a rate sufficient to neutralize the free alkali and alkaline by-products without regenerating the polymeric alcohol.

3,884,909
GELATINIZABLE CROSSLINKED CATIONIC STARCH AND METHOD FOR ITS MANUFACTURE

Adrian P. Kightlinger, Clinton, Iowa; Edward K. Crosby, deceased, late of Clinton, Iowa (by Lovice Vivian Crosby, executrix), and Edwin L. Speakman, Clinton, Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

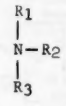
Continuation-in-part of Ser. No. 400,300, Sept. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 298,067, Oct. 16, 1972, Pat. No. 3,778,431. This application Apr. 1, 1974, Ser. No. 456,493The portion of the term of this patent subsequent to Dec. 11, 1990, has been disclaimed.

Int. Cl. C08b *19/06*

U.S. Cl. 260—233.3 R **13 Claims**

1. A gelatinizable crosslinked cationic starch product prepared by the sequential steps of:

a. reacting an aqueous suspension of granular starch under non-gelatinizing conditions with (1) an alkali-catalyzable polyfunctional organic crosslinking agent, the functional moieties of which are reactive with starch hydroxyl groups, ammonia, and secondary and tertiary amine groups under aqueous alkaline conditions and (2) the reaction product of said crosslinking agent with a nitrogenous compound selected from the group consisting of ammonia and C_{2-12} secondary and tertiary amines having the structure,



in which R_1 is a monovalent radical selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, aryl, alkaryl, and aralkyl, R_2 and R_3 are monovalent radicals independently selected from the group consisting of alkyl, substituted alkyl, cycloalkyl, aryl, alkaryl, and aralkyl, and R_2 and R_3 when taken together form with the N atom saturated heterocyclic rings selected from the group consisting of substituted and unsubstituted piperidine, piperazine and morpholine, the length of any acyclic alkyl group being no greater than 4 carbon atoms, the reaction mixture having a slurry alkalinity of from about 20 to about 65, the amount of crosslinking agent being sufficient to impart to the starch a Sedimentation Value of from about 81 to about 98, and the amount of amine being sufficient to impart to the starch a degree of cationic substitution of from about 0.001 to about 0.10; and

b. depolymerizing the cationic crosslinked reaction product of step a to an alkaline paste fluidity of from about 201 to 299.

3,884,910
TRIAZOLINONES

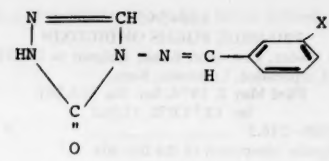
Kurt H. G. Pilgram, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 30, 1972, Ser. No. 311,008

Int. Cl. C07d *55/06*

U.S. Cl. 260—240 G **1 Claim**

1. A compound of the formula



wherein X is chlorine, trifluoromethyl or trifluoromethoxy.

3,884,911
DERIVATIVES OF BERBERINE

Fumitaka Shimada, Iwatsuki; Tetsuro Ikekawa, Narashino; Tomio Endo, Kobe; Hideo Kuroda, Urawa; Yoshiaki Ikeda, Tokyo; Kooishi Tachibana, Ohmiya, and Yoshimi Okazaki, Tokyo, all of Japan, assignors to Kanebo, Ltd., Tokyo and Tetsuro Ikekawa, Chiba, both of, Japan

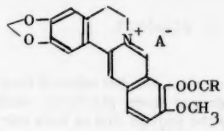
Filed Aug. 22, 1973, Ser. No. 390,402

Claims priority, application Japan, Aug. 25, 1972, 47-85651

Int. Cl. C07d *35/28*

U.S. Cl. 260—240 J **6 Claims**

1. A derivative of berberine of the formula:



wherein RCO represents a cinnamoyl group which may be substituted with chloro, acetoxy, methoxy or methylenedioxy groups on the benzene ring, and A represents an anion.

3,884,912
4-PIPERIDONE DERIVATIVES, THEIR PREPARATION AND THEIR USE AS STABILIZERS

Keisuke Murayama; Susumu Higashida, and Katsuaki Matsui, all of Tokyo, Japan, assignors to Sankyo Company Limited, Japan

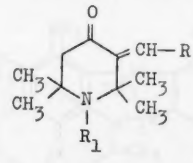
Filed Jan. 22, 1973, Ser. No. 325,742

Claims priority, application Japan, Jan. 26, 1972, 47-9670; Feb. 22, 1972, 47-18346

Int. Cl. C09b *23/00*

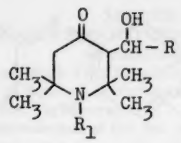
U.S. Cl. 260—240 F **12 Claims**

1. A compound selected from the group consisting of the piperidone derivatives having the formulae



(I)

wherein R represents a phenyl or naphthyl group which may be substituted with nitro, lower alkyl, halogen, hydroxy, lower alkyl hydroxy, hydroxy lower alkyl or formyl or a 5- or 6-membered heterocyclic group selected from the group consisting of 2-furyl, 2-thienyl, 3-pyrrolyl, 2-pyridyl and 4-pyridyl and R_1 represents hydrogen atom or an alkyl group of 1 to 4 carbon atoms and



(II)

wherein R and R_1 are as defined above.

3,884,913

4-(1′-ALKYL-5′-NITROIMIDAZOLYL-2′-METHYLENE-IMINO)-TETRAHYDRO-1,4-THIAZINE-1,1-DIOXIDES AND PROCESS FOR THEIR MANUFACTURE

Erhardt Winkelmann, Kelkheim, Taunus, and Wolfgang Raether, Dreieichenhain, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

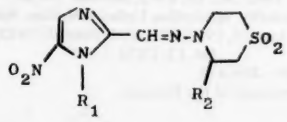
Filed Dec. 19, 1973, Ser. No. 425,979

Claims priority, application Germany, Dec. 21, 1972, 2262553

Int. Cl. C07d *49/36*; C09b *23/00*

U.S. Cl. 260—240 G 7 Claims

1. A 4-(1′-alkyl-5′-nitroimidazolyl-2′-methylene-imino)-tetrahydro-1,4-thiazine-1,1-dioxide of the formula I



in which R_1 stands for a hydrogen atom, a methyl, ethyl or 2-hydroxy-ethyl group and R_2 for a hydrogen atom, a methyl, ethyl or methoxy-methyl group.

3,884,914

MANDELAMIDOCEPHALOSPORINS WITH IMPROVED PROPERTIES

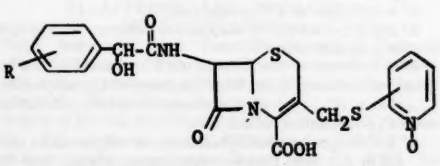
James S. Frazee, Collingswood, N.J., and Timothy Yu-Wen Jen, Broomall, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed July 5, 1973, Ser. No. 376,653

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C 5 Claims

1. A compound of the formula



where R is hydrogen, alkyl or alkoxy of C_1–C_4, fluoro, chloro, bromo, hydroxy, amino, nitro, or trifluoromethyl or the non-toxic pharmaceutically acceptable salts thereof.

3,884,915

7-ALKYLMERCAPTOACETAMIDO CEPHALOSPORINS

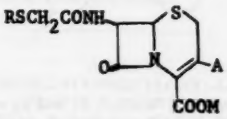
Robert M. DeMarinis, King of Prussia, and John R. E. Hoover, Glenside, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed June 4, 1973, Ser. No. 366,816

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C 7 Claims

1. A compound of the formula:



in which:

R is lower alkyl of one to six carbon atoms;

M is hydrogen or an alkali metal or ammonium cation; and

A is CH_2SHet, where Het is a five or six membered heterocyclic ring containing two to four atoms selected from the group consisting of N, O and S, unsubstituted or substituted with from one to two groups selected from lower alkyl, alkoxyalkyl or trifluoromethyl, each alkyl or alkoxy having from one to four carbon atoms.

3,884,916

2,2-DIARYL-4-(4-ARYL-4-HYDROXY-PIPERIDINO)-BUTYRAMIDES

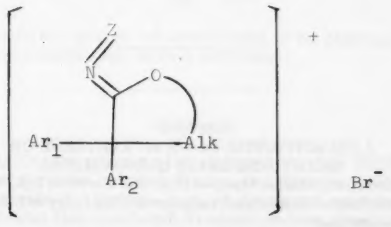
Paul Adriaan Jan Janssen, Vosselaar; Carlos Jan Ernest Josef Niemegeers, Deurne; Raymond Antoine Stokbroekx, and Jan Vandenberk, both of Beerse, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 129,607, March 30, 1971, Pat. No. 3,714,159, which is a continuation-in-part of Ser. No. 42,530, June 1, 1970, abandoned. This application Dec. 7, 1972, Ser. No. 379,155

Int. Cl. C07d *87/32*, *27/04*, *29/12*

U.S. Cl. 260—247.7 G 20 Claims

1. 3,3-Diaryl-tetrahydro-2-furylidene ammonium salts having the formula:

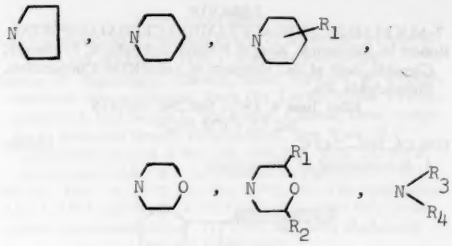


wherein:

Ar_1 is a member selected from the group consisting of phenyl and halophenyl;

Ar_2 is a member selected from the group consisting of phenyl and halophenyl;

N=Z is a member selected from the group consisting of



and $N(CH_2CH{=}CH_2)_2$, in which R_1 and R_2 represent lower alkyl, R_3 is a member selected from the group consisting of lower alkyl and benzyl, and R_4 is lower alkyl; and

—Alk— is a member selected from the group consisting of $-CH_2CH_2-$ and $-CH_2CH(CH_3)-$;

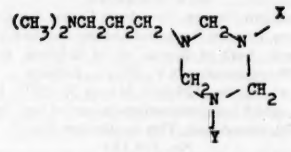
provided that, when said —Alk— is $-CH_2CH(CH_3)-$, then said N=Z is other than $N(CH_2CH{=}CH_2)_2$.

3,884,917
TERTIARY AMINES

Arthur Ibbotson, Blackley, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 29, 1974, Ser. No. 465,417
Claims priority, application United Kingdom, May 8, 1973, 21827/73
Int. Cl. C07d *55/14*
U.S. Cl. 260—248 NS **2 Claims**

1. A tertiary amine having the formula:



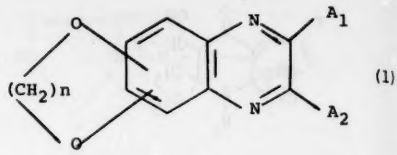
wherein X represents dimethylaminopropyl, lower alkyl, amino lower alkyl or hydroxy lower alkyl and Y represents lower alkyl, amino lower alkyl or hydroxy lower alkyl.

3,884,918
2,3 SUBSTITUTED, 5,6 OR 6,7 ETHYLENE OR METHYLENE DIOXY QUINOXALINES

Hans-Peter Schlunke, Marly-le-Petit, and Christian Egli, Magden, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 176,689, Aug. 31, 1971, Pat. No. 3,767,402. This application May 21, 1973, Ser. No. 361,913
Claims priority, application Switzerland, Sept. 4, 1970, 13251/70
Int. Cl. C07d *51/78*
U.S. Cl. 260—250 Q **4 Claims**

1. A quinoxaline of the formula



(1)

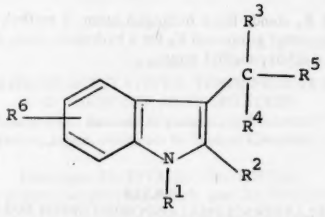
wherein A_1 and A_2 are each alkyl with maximum 3 carbon atoms, phenyl, dimethylaminophenyl, methoxyphenyl or pyridyl and *n* is 1 or 2, whereby the oxygen-containing ring is connected in the 5, 6 or 6, 7 position with the quinoxaline group.

3,884,919
1-(QUINAZOLINYL) INDOL-3-YLACETIC ACIDS, ESTERS AND AMIDES

George Richard Birchall; Walter Hepworth, and Stephen Collyer Smith, all of MacClesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 10, 1972, Ser. No. 296,202
Claims priority, application United Kingdom, Nov. 3, 1971, 51086/71; Apr. 19, 1972, 18116/72; June 30, 1972, 30767/72
Int. Cl. C07d *51/48*
U.S. Cl. 260—256.4 Q **7 Claims**

1. A compound of the formula:



I

wherein:

R^1 is a quinazolinyl radical or a quinazolinyl radical bearing not more than two substituents selected from C_{1-5}- alkyl, C_{1-5}-alkoxy, C_{1-5}-alkylthio, amino, halogen, trifluoromethyl, trichloromethyl and phenyl substituents, the quinazolinyl radical being linked to the nitrogen atom of the indole nucleus through position 2 or 4 of the quinazolinyl radical;

R^2 is hydrogen or a C_{1-3}-alkyl radical;

R^3 and R^4, which can be the same or different, are hydrogen or a methyl radical;

R^5 is a radical of the formula $-COR^7$, wherein R^7 is a hydroxy, C_{1-5}-alkoxy, benzyloxy, phenoxy, di-C_{1-5}-alkylamino-C_{1-5}-alkoxy, (C_{3-6}-cycloalkyl)methoxy, amino, C_{1-5}-alkylamino or di-C_{1-5}-alkylamino radical; and

R^6 is hydrogen or a methylenedioxy or ethylenedioxy radical or not more than two substituents selected from the group consisting of C_{1-5}-alkoxy, C_{1-5}-alkyl, cycloalkyl of not more than 5 carbon atoms, di-C_{1-5}-alkylamino radicals and halogen atoms;

or a pharmaceutically-acceptable salt thereof.

3,884,920

11-BASICALLY SUBSTITUTED DIBENZ [B,F] [1,4] OXAZEPINES

Jean Schmutz, Muri; Fritz Hunziker, and Franz Martin Kunzle, both of Bern, all of Switzerland, assignors to Sandoz-Wander, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 55,603, July 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 797,281, Feb. 6, 1969, Pat. No. 3,546,226, which is a continuation-in-part of Ser. No. 712,956, March 14, 1968, abandoned. This application Dec. 29, 1971, Ser. No. 213,709

Claims priority, application Switzerland, July 14, 1967, 11015/67; Nov. 3, 1967, 15453/67; Feb. 14, 1968, 2201/68

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 TR 8 Claims

1. The compound, which is 2-Methylsulphonyl-11-(4-methyl-1-piperazinyl)-dibenz[b,f] [1,4] oxazepine and its acid addition salts.

3,884,921

ISOINDOLINE DERIVATIVES

Claude Cotrel, Val-de-Marne; Claude Jeanmart, and Mayer Naoum Messer, both of Essonne, all of France, assignors to Rhone-Poulenc, S.A., Paris, France

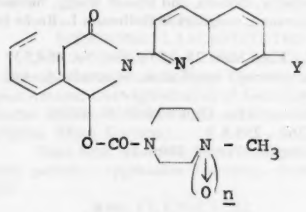
Filed Dec. 29, 1972, Ser. No. 319,879

Claims priority, application France, Jan. 10, 1972, 72.00650; Nov. 21, 1972, 72.41272

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 BQ 8 Claims

1. An isoindoline of the formula:



wherein Y is halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or nitro, and *n* is zero or 1, or a pharmaceutically acceptable non-toxic acid addition salt thereof.

3,884,922

11-(4-PYRIDYLALKYL-PIPERAZINO)-DIBENZOTHIAZEPINES

Michio Nakanishi, Oita; Tomohiko Munakata, Fujuoka; Yutaka Maruyama, Tokyo, and Shinro Setoguchi, Fukuoka, all of Japan, assignors to Yoshitomi Pharmaceutical Industry, Ltd., Osaka, Japan

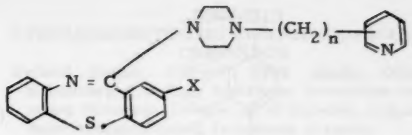
Division of Ser. No. 60,139, July 31, 1970, Pat. No. 3,761,481. This application Mar. 9, 1973, Ser. No. 339,794

Claims priority, application Japan, July 31, 1969, 44-60651; Sept. 25, 1969, 44-76775; Oct. 2, 1969, 44-79478

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 TR 9 Claims

1. A compound of the formula:



wherein X is H or Cl, and *n* is 1 or 2; or the pharmaceutically acceptable acid addition salts thereof.

3,884,923

1-[3-(1-ETHYNLCYCLOHEXYLOXY)-2-HYDROXY]-PROPYL-[4-PHENYL, OR 4-(2-PHENYL-2-ALKOXY)-]ETHYL-PIPERZINES

Roland-Yves Mauvernay, 13 rue Eugene Gilbert, 63000 Riom; Norbert Bush, Le Bouquet, 63410 Loubeyrat; Jacques Moleyre, 21, rue Sarrazin, 63200 Mozac; Andre Monteil, 25 bld Thermal, 63400 Chamalieres, and Jacques Simond, 63360 Gerzat, all of France

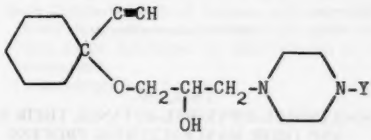
No Drawing. Filed Apr. 12, 1973, Ser. No. 350,517

Claims priority, application France, Apr. 13, 1972, 72.12893

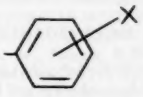
Int. Cl. C07d *51/70*

U.S. Cl. 260—268 PH 7 Claims

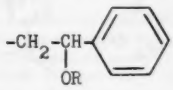
1. A piperazine of the formula



wherein Y is selected from the group consisting of groups having the formula



wherein X is selected from the group consisting of hydrogen, halogen, trifluoromethyl, alkyl of 1–4 carbon atoms, and alkoxy of 1–4 carbon atoms, and groups having the formula



wherein R is alkyl of 1–4 carbon atoms, or the pharmaceutically acceptable acid addition salts thereof.

3,884,924

PROCESS FOR THE PREPARATION OF ACENAPHTHENE-5,6-DICARBOXYLIC ACID IMIDE

Kurt Eiglmeier, Idstein, Taunus, and Henning Lubbers, Schwalbach, Staunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

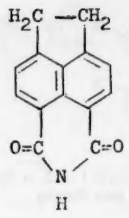
Filed Jan. 30, 1974, Ser. No. 437,993

Claims priority, application Germany, Feb. 1, 1973, 23048739

Int. Cl.[2] C07D *39/00*

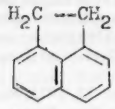
U.S. Cl. 260—281 2 Claims

1. A process for the preparation of acenaphthene-5,6-dicarboxylic acid imide of the formula (1)



(1)

which comprises the step of successively reacting acenaphthene of the formula (2)



(2)

with an alkali metal cyanate in an at least 90% hydrofluoric acid at a temperature of from −10°C to 40°C, and then at a temperature of from 60° to 120°C.

3,884,925

DIISOQUINOLYL-DIPYRIDYL-BUTANES, THEIR SALTS AND THEIR MANUFACTURING PROCESS

Stanislaw Buchner, Birsfelden, Switzerland, assignor to Sulco Basel AG, Basel, Switzerland

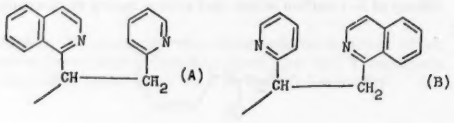
Filed June 19, 1973, Ser. No. 371,526

Claims priority, application Switzerland, June 19, 1972, 9150/72

Int. Cl. C07d *33/50*

U.S. Cl. 260—288 R **2 Claims**

1. Di-(1-isoquinolyl)-di-(2-Pyridyl)-butanes of the formulae A—A, A–B and B—B, in which A and B represent the following groups:



and their non-toxic salts with inorganic and organic acids.

3,884,926

DISPERSE DYESTUFFS

Colin William Greenhalgh, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

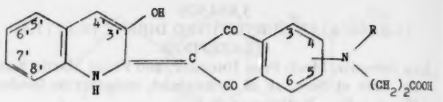
Filed July 12, 1973, Ser. No. 378,608

Claims priority, application United Kingdom, Aug. 15, 1972, 38011/72

Int. Cl. C07d *33/48*

U.S. Cl. 260—289 QP **1 Claim**

1. A disperse dyestuff of the formula:



wherein R is selected from the group consisting of hydrogen, lower alkyl and —CO lower alkyl, and the carbon atoms in the 4′, 6′ or 8′ positions of the quinoline ring can be substituted by chlorine or bromine.

3,884,927

PROCESS FOR THE PREPARATION OF VINCAMINE

Jacques Martel, Bondy, and Germain Costerousse, Vernouillet, both of France, assignors to Rousell Uclaf, Paris, France

Filed Mar. 27, 1973, Ser. No. 345,255

Claims priority, application France, Apr. 14, 1972, 72.13135

Int. Cl. C07d *57/08*

U.S. Cl. 260—293.53 **3 Claims**

1. A process for the preparation of vincamine, which comprises:
   a. reacting eburnamonine with an ethynylmagnesium halide to give [20α,21α] 16α-ethynyl eburnane 16β-ol;
   b. reacting the [20α,21α] 16α-ethynyl eburnane 16β-ol with an oxidizing agent to give vincaminic acid;
   c. treating the vincaminic acid with a methylating agent to give vincamine; and
   d. isolating the vincamine.

3,884,928

IMIDAZOLE DERIVATIVES

Hans Bruderer, Benken, and Rudolf Ruegg, Bottmingen, both of Switzerland, assignors to Hoffmann-LaRoche Inc., Nutley, N.J.

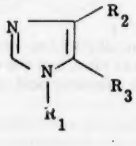
Filed Mar. 25, 1974, Ser. No. 454,537

Claims priority, application Switzerland, Apr. 5, 1973, 4919/73

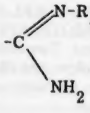
Int. Cl. C07d *31/36, 49/36*

U.S. Cl. 260—295.5 R **7 Claims**

1. A compound of the formula



wherein R_1 is lower alkyl. R_2 is fluorine, chlorine or bromine and R_3 is



wherein R_4 is hydroxy, lower alkoxy, lower alkanoyloxy, lower alkoxycarbonyloxy, phenylcarbonyloxy, lower alkylphenylcarbonyloxy, lower alkoxyphenylcarbonyloxy, halophenylcarbonyloxy, pyridylcarbonyloxy, lower alkylpyridylcarbonyloxy, lower alkoxypyridylcarbonyloxy or halopyridylcarbonyloxy, or a pharmaceutically acceptable salt thereof.

3,884,929

SELECTED 3-TRICHLOROMETHYL-5-SUBSTITUTED 1,2,4-THIADIAZOLES

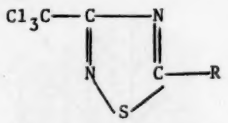
Eric Smith, P.O. Box 208, Farmington, Conn. 06032

Continuation-in-part of Ser. No. 98,182, Dec. 14, 1970, abandoned, which is a division of Ser. No. 751,728, Aug. 12, 1968, Pat. No. 3,573,317. This application Oct. 29, 1973, Ser. No. 410,728

Int. Cl. C07d 91/60

U.S. Cl. 260—302 SD 3 Claims

1. A 3-trichloromethyl-5-substituted-1,2,4-thiadiazole having the formula



wherein R is m-haloanilino or N,N-di(lower alkyl having 1–4 carbons)-dithiocarbamoyl.

3,884,930

MESOIONIC 2,3-SUBSTITUTED 5-ACYLIMINO-1,3,4-THIADIAZOLES

Horst Koenig, Ludwigshafen; Peter Thieme, Ruchheim, and August Amann, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhine, Germany

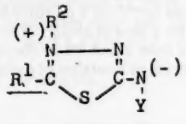
Filed Sept. 11, 1972, Ser. No. 288,124

Claims priority, application Germany, Sept. 21, 1971, 2147025

Int. Cl. C07d 91/62

U.S. Cl. 260—306.8 D 3 Claims

1. A mesoionic 1,3,4-thiadiazolimino-5 derivative of the formula:



in which

R^1 is phenyl which may bear chlorine, methoxy or ethoxy as a substituent,

R^2 is alkyl of one to five carbon atoms which may bear phenyl as a substituent; Y is acyl derived from a fatty acid of two to five carbon atoms, phenacetyl, phenylpropionyl, carbethoxy, dimethylaminocarbonyl, phenoxyacetyl, benzoyl or benzoyl substituted by 1-3 methoxy groups, ethoxy, carbethoxy, 1 or 2 chlorine groups, nitro, hydroxyl, acetoxy or methylaminocarbonyloxy, or a salt of a strong inorganic acid or a methoiodide of said derivative.

3,884,931

2-TRIFLUOROMETHYLIMINO-BENZO-HETEROCYCLIC COMPOUNDS

Gerhard Buttner, Cologne; Erich Klauke, Odenthal-Hahnenberg; Paul-Ernst Frohberger, Leverkusen, and Ingeborg Hammann, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

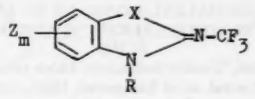
Filed Mar. 26, 1973, Ser. No. 344,800

Claims priority, application Germany, Apr. 15, 1972, 2218329

Int. Cl. C07d 85/48

U.S. Cl. 260—307 D 7 Claims

1. A 2-trifluoromethylimino-benzo-heterocyclic compound with five-members in the heterocyclic ring of the formula



in which

X is oxygen or sulfur,

R is methyl, ethyl, cyclohexyl, phenyl, chlorophenyl, nitrophenyl, lower alkylcarbo-lower alkoxy, methanesulfonyl, ethanesulfonyl, p-toluenesulfonyl, dimethylamidosulfonyl, or —CO-R′,

R′ is alkyl or alkoxy with up to 8 carbon atoms, phenyl, lower alkylamino or di-lower alkylamino,

each Z independently is halogen, trifluoromethyl, nitro, lower alkyl, sulfonic acid, sulfonic acid amide, or sulfonic acid amide substituted by alkyl with up to 6 carbon atoms, and

m is an integer from 0 to 2.

3,884,932

REACTION PRODUCT OF ALKYL OR ALKENYL SUCCINIC ANHYDRIDES WITH BENZOTRIAZOLE OR METHYL BENZOTRIAZOLE

Harry J. Andress, Jr., Pitman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 247,067, April 24, 1972, Pat. No. 3,788,993, which is a continuation-in-part of Ser. No. 222,642, Feb. 1, 1972, abandoned. This application Oct. 3, 1973, Ser. No. 403,142

Int. Cl. C07d 55/04, 99/04

U.S. Cl. 260—308 B 5 Claims

1. The reaction product of at least one member of the group consisting of alkyl and alkenylsuccinic anhydrides wherein the alkyl and alkenyl groups each contain from eight to 30 carbon atoms, and at least one member of the group consisting of benzotriazole and methyl benzotriazole in a mole ratio of from 1:1 to 1:2 at a temperature from about 125°C. to about 145°C.

3,884,933

CERTAIN SUBSTITUTED BENZIMIDAZOLES

Hans F. W. Röchling; Karl-Heinz Büchel, and Friedrich W. A. G. K. Korte, all of Hangelar, Germany, assignors to Shell Oil Company, Houston, Tex.

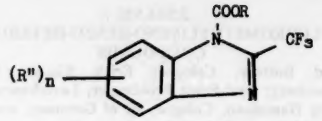
Filed Apr. 13, 1966, Ser. No. 542,204

Claims priority, application Germany, Apr. 15, 1965, 96569; Apr. 15, 1965, 96570

Int. Cl. C07d 49/38

U.S. Cl. 260—309.2 1 Claim

1. A benzimidazole of the formula



wherein R is a member selected from the group consisting of lower alkenyl and benzyl and wherein R'' is a member selected from the group consisting of halo and nitro and wherein *n* is an integer of 1–4.

3,884,934

AMINOALKYL ESTERS OF DI- AND TRIHALOPYRAZOLE-1-ALKANOIC AND -1-ALKENOIC ACIDS

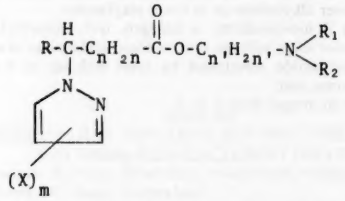
Gabriel Kornis; Arnolds Steinhards; Eldon George Nidy, and Henry J. Vostral, all of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 16,577, March 4, 1970, Pat. No. 3,849,106. This application Aug. 19, 1974, Ser. No. 498,478

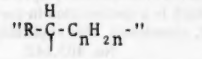
Int. Cl. C07d *49/18*

U.S. Cl. 260—310 R **5 Claims**

1. A compound of the formula:



wherein *n* is an integer 0, 1, 2, or 3; X is a bromine atom; *m* is the integer 3, R is hydrogen, alkyl of from one to 10 carbon atoms, inclusive, or alkenyl of from two to 10 carbon atoms, inclusive, the sum of the carbon atoms in the group



being not more than 11; $-C_n \quad H_{2n} \quad -$ is alkylene of from 2 to eight carbon atoms, inclusive; *n'* being an integer from 2 to 8, inclusive; and R_1 and R_2 are individually lower-alkyl of from one to eight carbon atoms; or mineral acid addition salts thereof.

3,884,935

SHRINK-FILM PACKAGE

Henry Knox Burns, III, 1830 Redwood Dr., Macon, Ga.

Filed Nov. 6, 1972, Ser. No. 303,762

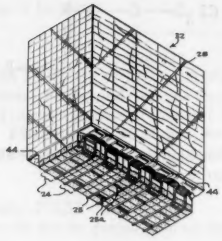
Int. Cl. B65d *65/16, 19/22, 71/00, 85/46, 85/62*

U.S. Cl. 206—322 **16 Claims**

1. A heat-shrunk film-wrapped rigid, generally cube-shaped unitary package of masonry brick articles and having substantial 3-dimensional size, said brick articles being of parallelpiped prismatic form and having a pair of major planar opposed surfaces for stacking said bricks and having inherent tolerance variations which contribute collectively to the unstable stacking of bricks in substantial height, superimposed layer-relation when uniformly oriented, said brick package comprising;

a. a predetermined plurality of generally uniform masonry brick articles oriented in like manner and disposed in abutting uniform alignment collectively having corresponding sides coplanarly aligned, and covered and held together to collectively constitute a sub-package by an overlaying film of heat-shrunk flexible material having film edge portions overlaying opposite end sides of endmost brick articles of said sub-package;

b. a predetermined plurality of said heat-shrunk-wrapped sub-packages disposed in adjacent contiguous and generally coplanar relation to constitute at least one tier or layer of said package; and



c. said tier of sub-packages having at least one layer of heat-shrunk material outwardly overlaying and essentially tightly embracing all of said heat-shrunk film-wrapped sub-packages so as to hold them in rigid assembly capable of being lifted from beneath, supported and transported as a unitary package.

3,884,936

PREPARATION OF 2-PYRROLIDONE

Elmer J. Hollstein, Wilmington, Del., assignor to Sun Research and Development Company, Marcus Hook, Pa.

Continuation-in-part of Ser. No. 108,376, Jan. 21, 1971, abandoned. This application Apr. 23, 1973, Ser. No. 353,277

Int. Cl. C07d *27/08*

U.S. Cl. 260—326.5 FN **3 Claims**

1. A process for preparing 2-pyrrolidone which comprises reacting maleic acid or maleic ahydride with hydrogen and ammonia in an aqueous system at a mole ratio of ammonia to acid or anhydride of from 1.0:1 to 1.2:1 at a temperature from about 200° to about 300°C, at a pressure from about 1,000 to about 3,000 psig for a time of about 0.5 to about 8 hours, and in the presence of from about 1% to about 10% by weight of said acid or anhydride of a catalyst of palladium supported on carbon.

3,884,937

ESTERS OF 1,4-BENZODIOXAN-2-CARBOXYLIC ACID AS ATTRACTANTS FOR THE EUROPEAN CHAFER

Terrence P. McGovern, Bowie; Morton Beroza, Silver Spring, both of Md., and Bart J. Fiori, Genova, N.Y., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 90,792, Nov. 18, 1970, Pat. No. 3,777,017. This application Aug. 1, 1973, Ser. No. 384,652

Int. Cl. C07d *15/18*

U.S. Cl. 260—340.3 **1 Claim**

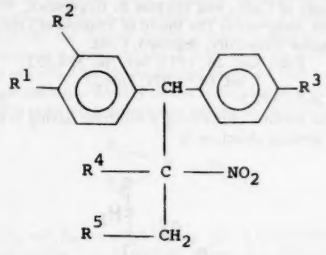
1. Propyl 1,4-benzodioxan-2-carboxylate.

3,884,938
1-(4-ALKOXY(OR ALKYLTHIO)PHENYL)-1-(METHYLENEDIOXYPHENYL)-2-NITROALKANES

George Holan, Brighton, Australia, assignor to Commonwealth Scientific & Industrial Research Organization, Campbell, Australia

Division of Ser. No. 174,265, Aug. 23, 1971, Pat. No. 3,823,192. This application Dec. 20, 1973, Ser. No. 426,533
Claims priority, application Australia, Feb. 5, 1971, 3947/71; Feb. 12, 1971, 4010/71
Int. Cl. C07d *13/10*
U.S. Cl. 260—340.5 4 Claims

1. A compound of the formula:



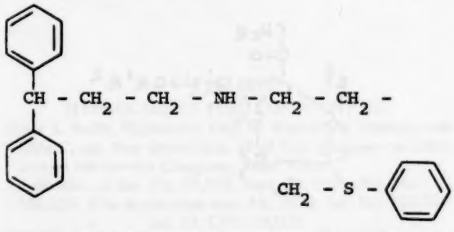
wherein R^1 and R^2 together form a methylenedioxy group; R^3 is a methoxy, ethoxy, propoxy, methylthio, ethylthio or propylthio group; and one of the groups R^4 and R^5 is hydrogen and the other of said groups is hydrogen or a methyl group.

3,884,939
1,1-DIPHENYL-1'-PHENYLTHIO-DI-PROPYLAMINE AND THE SALTS THEREOF

Pietro Bianchini, Via Sagittario, 58, Modena, Italy; Eupremio Vitale, Via Murri, 153; Guido Guerra, Via Castuglione, 34, and Giustino Censoni, Via Mazzini, 44, all of Bologna, Italy

Continuation-in-part of Ser. No. 270,807, July 11, 1972, abandoned. This application Sept. 22, 1972, Ser. No. 291,273
Claims priority, application Italy, July 15, 1971, 3476/71
Int. Cl. C07d *5/12*
U.S. Cl. 260—343.7 2 Claims

1. Compound of the formula:



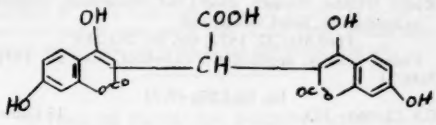
and its pharmaceutically acceptable salts.

3,884,940
NEW BIS-(4,7-DIHYDROXYCOUMARINYL-3-)-ACETIC ACID

Karel Fucik, Prague, Czechoslovakia, assignor to SPOFA, United Pharmaceutical Works, Prague, Czechoslovakia

Filed Apr. 11, 1973, Ser. No. 350,157
Claims priority, application Czechoslovakia, Apr. 12, 1972, 2442-72
Int. Cl. C07d *7/26*
U.S. Cl. 260—343.2 R 12 Claims

1. The bis-(4,7-dihydroxycoumarinyl-3)-acetic acid of the formula

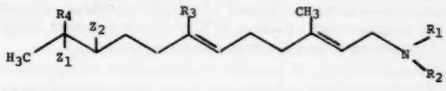


3,884,941
EPOXY CONTAINING ACYLATED TERPENOID AMINES

Friedrich Karrer, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 155,602, June 22, 1971, Pat. No. 3,786,097. This application Oct. 17, 1973, Ser. No. 407,111
Claims priority, application Switzerland, June 26, 1970, 9706; June 26, 1970, 14890
Int. Cl. C07d *1/00, 1/06*
U.S. Cl. 260—348 A 3 Claims

1. A compound of the formula:



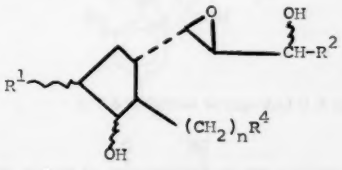
wherein
Z_1 and Z_2 together form an oxygen bridge,
R_1 is acyl,
R_2 is C_1-C_4 alkyl or C_2-C_4 alkenyl, and
R_3 and R_4 are each methyl or ethyl.

3,884,942
PROCESS FOR THE PREPARATION OF CYCLOPENTANE DERIVATIVES

Michael Peter Lear Caton, Upminster; Edward Charles John Coffee, London, and Gordon Leonard Watkins, Dagenham, all of England, assignors to May & Baker Limited, Essex, England

Continuation-in-part of Ser. No. 108,981, Jan. 22, 1971, abandoned. This application Mar. 21, 1973, Ser. No. 343,460
Claims priority, application United Kingdom, Mar. 2, 1973, 10402/73; Jan. 23, 1970, 3494/70
Int. Cl. C07d *1/22, 1/20;* C07c *69/74*
U.S. Cl. 260—348 A 2 Claims

1. A cyclopentane compound of the formula:



wherein R^1 represents a hydrogen atom or a lower alkyl group, R^2 represents a straight- or branched-chain alkyl group of 4 to

9 carbon atoms, R^4 represents a carboxy group or a group of formula $COOR^8$, wherein R^8 represents a lower alkyl group, and n represents 5 or 6, and, when R^4 represents a carboxy group, non-toxic salts thereof.

3,884,943

PREPARATION AND SEPARATION OF 1,5- AND 1,8-DIHYDROXYANTHRAQUINONE

Rudolf Winkler, Reinach, Basel-Land, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed May 22, 1972, Ser. No. 255,253

Claims priority, application Switzerland, May 26, 1971, 7686/71

Int. Cl. C07c *49/74*

U.S. Cl. 260—383 **15 Claims**

1. A process for the production and isolation of 1,5-dihydroxyanthraquinone from a mixture of 1,5- and 1,8-dialkoxyanthraquinones in which the alkoxy groups contain 1 to 3 carbon atoms, which comprises the steps of

a. hydrolyzing said mixture with a strong mineral acid in a molar ratio of at least 2 mols of the mineral acid per mol of said mixture, in acetic acid as solvent and at a temperature of above 80°C., to form a reaction mixture containing 1,5-dihydroxyanthraquinone and 1,8-dihydroxyanthraquinone,

b. maintaining the reaction mixture at a temperature of above 80°C. to retain the 1,8-dihydroxyanthraquinone in solution and allow the 1,5-dihydroxyanthraquinone to precipitate, and

c. removing the precipitated 1,5-dihydroxyanthraquinone at a temperature of above 80°C. to leave a mother liquor containing the 1,8-dihydroxyanthraquinone.

3,884,944

CYCLIC ACETALS CONTAINING EPOXIDE GROUPS

Alfred Renner, Munchenstein, and Rolf Hugi, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

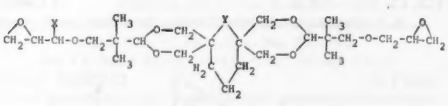
Filed Feb. 15, 1973, Ser. No. 332,840

Claims priority, application Switzerland, Feb. 24, 1972, 2638/72

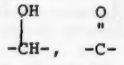
Int. Cl. C07d *15/04*

U.S. Cl. 260—340.7 **4 Claims**

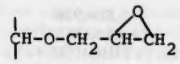
1. A cyclic acetal of 2-epoxy-propoxy-pivaldehyde of the formula



wherein X is hydrogen or methyl; and Y is



or



3,884,945

SYNTHESIS OF STEROIDS BY CYCLIZATION IN NITRO SOLVENTS

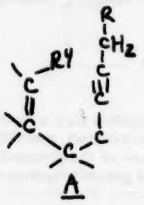
William S. Johnson, Portola Valley; Douglas R. Morton, Palo Alto, both of Calif., and Michael B. Gravestock, Worthing, England, assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Apr. 26, 1973, Ser. No. 354,532

Int. Cl.² C07C *169/22*

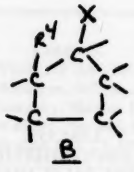
U.S. Cl. 260—397.3 **5 Claims**

1. In the method of cyclizing a substrate having in its molecule the skeletal structure A



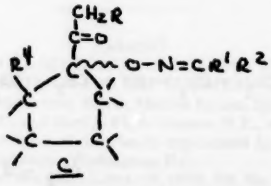
A

to produce a cyclizatiin product having in its molecule the skeletal structure B



B

wherein R selected from the class consisting of hydrogen, lower alkyl, aryl, halogen and protected hydroxyl; R^4 is H or lower alkyl and X is a group derived from $R—CH_2—C$, the improvement which comprises conducting the cyclization in a solvent which contains at least a major proportion of a primary or secondary aliphatic nitro compound or mixture thereof, thereby forming a cyclization product having in its molecule the skeletal structure C



C

wherein R^1 and R^2 are monovalent groups or a single bivalent group derived from the nitro compound or mixture of nitro compounds.

3,884,946
PROCESS FOR THE PRODUCTION OF ALKYLENE GLYCOL MONOESTERS

Eric Sung, Monheim Rhld.; Wilfried Umbach, Langenfeld, and Horst Baumann, Leichlingen, all of Germany, assignors to Henkel & Cie GmbH, Dusseldorf, Germany

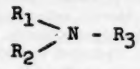
Continuation-in-part of Ser. No. 141,962, May 10, 1971, abandoned. This application Sept. 24, 1973, Ser. No. 399,812

Claims priority, application Germany, May 16, 1970, 2024050

Int. Cl. C07c *67/00, 143/90*

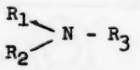
U.S. Cl. 260—400 **4 Claims**

1. A process for the production of alkylene glycol monoesters which consists essentially of reacting a carboxylic acid having from 8 to 24 carbon atoms selected from the group consisting of alkanoic acids, alkenoic acids, and mixtures thereof with an alkylene-vic.-oxide having 2 to 4 carbon atoms in substantially the stoichiometric amount based on said carboxylic acid, at a temperature of from 20°C to 200°C in the presence of from 1 to 5% by weight, based on said carboxylic acid, of an aliphatic tertiary amine catalyst which is in liquid form at the reaction temperature having the formula



wherein R_1 and R_2 are alkyl having 1 to 4 carbon atoms and R_3 is alkyl having 8 to 20 carbon atoms, and recovering said alkylene glycol monoester in yields of 87% or over.

4. A process for the production of sulfates of carboxylic acid alkylene glycol monoesters which consists essentially of reacting a carboxylic acid having from 8 to 24 carbon atoms selected from the group consisting of alkanoic acids, alkenoic acids, and mixtures thereof, with an alkylene-vic.-oxide having 2 to 4 carbon atoms in substantially the stoichiometric amount based on said carboxylic acid, at a temperature of from 20°C to 200°C in the presence of from 1 to 5% by weight, based on said carboxylic acid, of an aliphatic tertiary amine catalyst which is in liquid form at the reaction temperature, having the formula



wherein R_1 and R_2 are alkyl having 1 to 4 carbon atoms and R_3 is alkyl having 8 to 20 carbon atoms, reacting the catalyst-containing reaction product with a sulfating agent, and recovering said sulfates of carboxylic acid alkylene glycol monoesters.

3,884,947
HYDROCARBON FUEL COMPOSITIONS

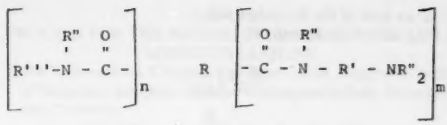
Elmer J. Badin, Highstown; Paul M. Kerschner, Trenton, and Aldo Cresti, New Brunswick, all of N.J., assignors to Cities Service Oil Service Company, Tulsa, Okla.

Division of Ser. No. 77,041, Sept. 30, 1970, Pat. No. 3,765,850. This application Apr. 18, 1973, Ser. No. 352,841

Int. Cl. C07c *103/30*

U.S. Cl. 260—404.5 **7 Claims**

1. A carboxylic acid salt of a compound having the formula



wherein m is at least 1 and the sum of n plus m is from 2 to about 6, R is a multivalent hydrocarbon group of about 2 to about 52 carbons, R′ is a hydrocarbylene group of about 2 to about 12 carbons, R″ is selected from the group consisting of hydrogen and hydrocarbyl groups of about 1 to about 30 carbons, R‴ is a hydrocarbyl group of about 2 to about 12 carbons, and at least about 10% of the amino groups contained therein are converted to the carboxylic acid salt.

3,884,948
METHOD OF PRODUCING INDIVIDUAL HIGHER BRANCHED CARBOXYLIC ACIDS

Viktor Judkovich Gankin; Vyacheslav Alexeevich Rybakov, both of ulitsa Khalturina, 23, kv. 6, Leningrad, U.S.S.R.; David Moiseevich Rudkovsky, deceased, late of Leningrad, U.S.S.R., and Galina Davydovna Rudkovskaya, administrator, Lesnoi prospekt, 61, kv. 250, Leningrad, U.S.S.R.

Filed Oct. 7, 1971, Ser. No. 187,546

Int. Cl. C08h *17/36*

U.S. Cl. 260—413 **9 Claims**

1. A method of producing individual higher branched unsaturated carboxylic acids having at least nine atoms in the "six" position with respect to the carbonyl oxygen, comprising the steps of aldol condensation of β-methyl-branched aldehydes having at least five carbon atoms at a temperature selected from the range of from 50° to 100° C., in the presence of an aqueous alkali solution as a catalyst with a concentration of 1 to 10 weight percent, followed by oxidation of the higher α, β-unsaturated aldehydes formed during the condensation with an oxygen-containing gas in the presence of an aqueous solution of an alkali having a concentration from 1 to 10 weight percent at a temperature selected from the range of from 10° to 70° C and subsequent neutralization of the reaction mass with 15–25 percent sulphuric acid to a ph of 4–7.

3,884,949
PROCESS FOR THE MANUFACTURE OF METAL COMPLEXES IN A PURE FORM

Hans Eicke, Reinach; Vladimir Arnold, Basel, and Francois L'Eplattenier, Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

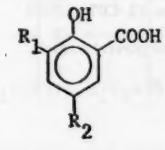
Filed Nov. 8, 1973, Ser. No. 413,993

Claims priority, application Switzerland, Nov. 22, 1972, 17010/72

Int. Cl. C07f *7/00*

U.S. Cl. 260—429.3 **4 Claims**

1. Process for the manufacture of metal complexes of divalent metals or oxo complexes of tetravalent metals with the acids of the formula I



(I)

in which R_1 and R_2 independently of one another denote hydrogen, bromine, chlorine, alkyl, cycloalkyl or aralkyl, characterised in that a successive reaction is carried out, in a solvent, of

a. an acid of the formula I with
b. a salt of the formula II

$$M_pX_{\frac{2-p}{m}}$$

in which M denotes the divalent cation of a divalent metal or of an oxo complex of a tetravalent metal, X denotes an anion which forms with M a salt which is soluble in the solvent of the process and p denotes 1 or 3 and m corresponds to the valency of the anion X, and

c. an alcoholate of the formula III

$$M'OR \quad (III)$$

in which M′ denotes the cation of an alkali metal and R denotes lower alkyl, the methoxyethyl group or the ethoxyethyl group, a, b and c are employed in the molar ratio of (2-i): 1/p:2 and i denotes 1 or 0 and, in the case that i is 1, the reaction mixture is reacted with water, the molar ratio of water to the acid of the formula I being at least 1.

3,884,950

ORGANOPOLYSILOXANE COMPOSITION HAVING IMPROVED HEAT STABILITY

Yoshinobu Koda, Chiba; Shosaku Sasaki, and Yoshiyuki Koda, both of Ichihara, all of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Dec. 13, 1973, Ser. No. 424,524
Int. Cl. C07f *7/08*
U.S. Cl. 260—448.2 S **10 Claims**

1. A method for improving the heat stability of organosilicon compounds in which the substituents on the silicon are monovalent hydrocarbon or halogenated monovalent hydrocarbon radicals having 1 to 30 carbon atoms comprising adding thereto the reaction product of a cerium salt of an organic carboxylic acid which is soluble in an aromatic hydrocarbon solvent or a chlorinated hydrocarbon solvent with an alkali metal siloxanolate having an average of at least three organosiloxane units per molecule and in which the substituents on the silicon are methyl, ethyl, phenyl, vinyl or 3,3,3-trifluoropropyl.

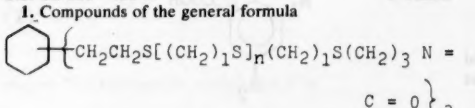
3,884,951

THIOETHER ISOCYANATE ADDUCTS

Alexis A. Oswald, Mountainside, N.J., assignor to Exxon Research & Engineering Company, Linden, N.J.

Division of Ser. No. 759,200, Sept. 11, 1968, Pat. No. 3,597,341. This application Jan. 18, 1971, Ser. No. 107,474
Int. Cl. C07c *119/04*
U.S. Cl. 260—453 A **3 Claims**

1. Compounds of the general formula



wherein 1 is a positive integer of from 1 to 12, and *n* is a positive integer of from 1 to 100.

2. Compound of the formula

$[CH_2-S-CH_2-CH_2-CH_2-N=C=O]_3$.

3. 3-β-hydroxyethylthiopropyl isocyanate.

3,884,952

VAPOR PHASE PROCESS FOR PREPARING HALOGENATED ISOCYANATES

Ehrenfried H. Kober, Kraiburg, Upper Bavaria, Germany; Richard H. Martin, Brevard, N.C., and Maurice A. Raymond, Northford, Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 53,562, July 9, 1970, abandoned. This application Apr. 5, 1973, Ser. No. 348,442
Int. Cl. C07c *119/04*
U.S. Cl. 260—453 PC **10 Claims**

1. A continuous vapor phase process for preparing a halogenated aromatic isocyanate from the corresponding aromatic nitro compound, which comprises:

a. vaporizing an aromatic nitro compound containing between about 6 and about 14 carbon atoms
b. reacting the resulting vapor with gaseous carbon monoxide
c. in the presence of a halogen donating gas selected from the group consisting of chlorine, bromine, fluorine, iodine, thionyl chloride, thionyl bromide, thionyl fluoride, thionyl iodide, sulfuryl chloride, sulfuryl bromide, sulfuryl fluoride, sulfuryl iodide, sulfur dichloride, sulfur dibromide, sulfur chloride, sulfur bromide, sulfur fluoride, sulfur iodide, hydrogen chloride, hydrogen bromide, hydrogen iodide, hydrogen fluoride, phosgene, carbon oxybromide, carbon oxyfluoride, nitrogen oxychloride, nitrogen oxybromide, nitrogen oxyfluoride, nitroxyl chloride, nitroxyl fluoride and nitrosotribromide and
d. an active catalyst selected from the group consisting of palladium halides and palladium oxides
e. in a reaction zone at a temperature from about 100° to about 500°C. and at a pressure of up to about atmospheric pressure and
f. withdrawing the reaction product containing the halogenated aromatic isocyanate from said reaction zone.

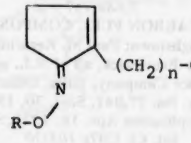
3,884,953

1-ALKOXIMINO-2-(ω-SUBSTITUTED-ALKYL)-2-CYCLOPENTENES

Karel Francis Bernady, Rockland; John Frank Poletto, Nanuet both of N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 335,842, Feb. 26, 1973, Pat. No. 3,836,581, which is a continuation-in-part of Ser. No. 208,951, Dec. 16, 1971, abandoned. This application June 19, 1974, Ser. No. 480,908
Int. Cl. C07c *143/68*
U.S. Cl. 260—456 A **3 Claims**

1. Compounds of the formula:



wherein *n* is an integer from 3 to 8, inclusive; R is a lower alkyl group; and Q is a lower alkanesulfonyloxy.

3,884,954

12-CYANO-5,6,7,12-TETRAHYDRODIBENZO[A,D]CYCLOOCTENES

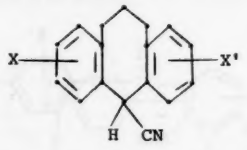
Marcia E. Christy, Perkasie, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 701,541, Jan. 30, 1968, abandoned. This application Nov. 7, 1972, Ser. No. 304,588

Int. Cl. C07c *121/64*

U.S. Cl. 260—465 R 2 Claims

1. A compound of the structural formula



wherein X and X′ are selected from the group consisting of hydrogen, halogen, alkyl having from 1–6 carbon atoms, trifluoromethyl, C_1–C_5-alkylsulfonyl, C_1–C_5-alkylmercapto, C_1–C_5-alkoxy or di-C_1–C_4-alkylsulfamoyl.

3,884,955

PROCESS FOR THE MANUFACTURE OF SUBSTITUTED O-CYANOBENZOIC ACID ESTERS

Jost Von Der Crone, and Andre Pugin, both of Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

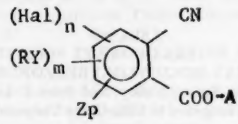
Filed Jan. 15, 1973, Ser. No. 323,686

Claims priority, application Switzerland, Jan. 17, 1972, 617/72

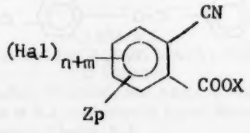
Int. Cl. C07c *121/52*

U.S. Cl. 260—465 D 5 Claims

1. Process for the manufacture of substituted o-cyanobenzoic acid esters of the formula



wherein A denotes an alkyl or aralkyl group, Hal denotes a chlorine or bromine atom, Y denotes an oxygen or sulphur atom, R denotes a hydrogen atom or an optionally substituted alkyl, cycloalkyl or aryl group, Z denotes a hydrogen atom, *n* denotes the number 0 to 3, *m* denotes the number 1 to 4 and p denotes the number 0 to 2, with the sum of *m*+*n*+*p* being at most 4, characterised in that a halogenocyanobenzoic acid derivative of the formula



wherein X denotes an ammonium, alkyl or aralkyl group and the remaining symbols have the abovementioned meaning, is reacted in a hydrophilic organic solvent with a compound of the formula RYMe, wherein Me denotes an alkali metal atom and R and Y have the abovementioned meaning and, if X denotes an ammonium group, the resulting reaction product is esterified.

3,884,956

PROCESS FOR THE MANUFACTURE OF 2,4-DICYANO-,5-DIMETHYLANILINE

Klaus Komorowski, Cologne, and Peter Kurtz, Tegernsee, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 18, 1973, Ser. No. 361,507

Claims priority, application Germany, May 6, 1972, 2222381

Int. Cl. C07c *121/78*

U.S. Cl. 260—465 E 7 Claims

1. Process for the preparation of 2,4-dicyano-3,5-dimethylaniline, comprising the steps of heating β-methyleneglutaric acid dinitrile or β-methylglutaconic acid dinitrile or a mixture thereof in the presence or absence of inert solvent to a temperature above 100°C in the presence of a basic catalyst under conditions sufficient to form 2,4-dicyano-3,5-dimethylaniline; and recovering said 2,4-dicyano-3,5-dimethylaniline.

3,884,957

PROCESS FOR THE PREPARATION OF NITRILES FROM ACIDS AND ORGANOSILYAMINES

Georges Bakassian, and Marcel Lefort, both of Caluire, Rhone, France, assignors to Rhone-Poulenc, S.A., Paris, France

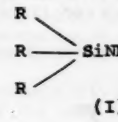
Continuation of Ser. No. 223,301, Feb. 3, 1972, abandoned. This application Feb. 21, 1974, Ser. No. 444,680

Claims priority, application France, Feb. 4, 1972, 72.03791

Int. Cl. C07c *121/02*

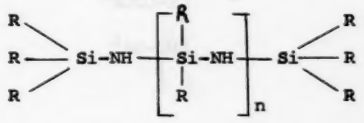
U.S. Cl. 260—465 B 8 Claims

1. A process for the preparation of a nitrile from a carboxylic acid wherein a carboxylic acid of formula $R'(COOH)_p$ is reacted with a primary silylamine or linear or cyclic silazane having the general formula:



(I)

or



(II)

or

in the presence of a Lewis acid as catalyst wherein *p* is 1, 2 or 3, R′ is a straight or branched alkyl or alkenyl group having 1–12 carbon atoms, a cycloalkyl or cycloalkenyl group with 5–12 ring carbon atoms which is unsubstituted or substituted by alkyl radicals containing up to 12 carbon atoms, or is a phenyl, alkylphenyl or phenylalkyl group, where the alkyl

residue contains 1–12 carbon atoms and where the phenyl residue is unsubstituted or is substituted by one or more hydroxyl groups in a juxta-nuclear position to the carboxy group, or is a monovalent group derived from a heterocyclic compound with 5 or 6 ring atoms in which the hetero atom is N, O or S, or is an aromatic radical consisting of a chain of at least 2 benzene rings where each benzene ring is bonded to the adjacent benzene ring by a direct valency bond or by an alkylene group having 1–6 carbon atoms, or R′ is a divalent or trivalent radical obtained by the removal of one or two hydrogen atoms respectively bonded to carbon atoms in the monovalent radical R′ as defined above: the symbols R, which may be the same or different, each represent an alkyl, alkylphenyl or phenylalkyl group where the alkyl group or portion is straight or branched and contains 1–12 carbon atoms or a cycloalkyl group of 5–6 ring carbon atoms or a phenyl group *n*=*o* or an integer of 1–100 and *m*=3, 4 or 5.

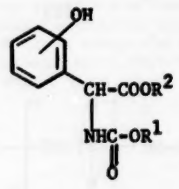
3,884,958

PROCESS FOR THE PREPARATION OF N-ACYL-α-(2- AND 4-HYDROXY)ARYLGLYCINE ESTERS

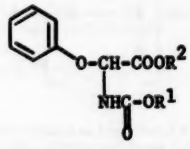
Kenneth G. Holden, Haddonfield, N.J., and Nelson C. F. Yim, Philadelphia, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Feb. 28, 1974, Ser. No. 446,984
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 C **9 Claims**

1. A process for preparing a compound of the formula:



in which:
the hydroxy group is ortho or para to the glycine side chain;
R^1 is t-butyl, β,β,β-trichloroethyl, benzyl, p-methoxybenzyl or p-nitrobenzyl; and
R^2 is lower alkyl of 1 to 4 carbon atoms, β,β,β-trichloroethyl, benzyl, p-methoxybenzyl or p-nitrobenzyl; comprising treating a compound of the formula:



where R^1 and R^2 are as defined above,
in a nonpolar organic solvent with a Lewis or a protic acid catalyst.

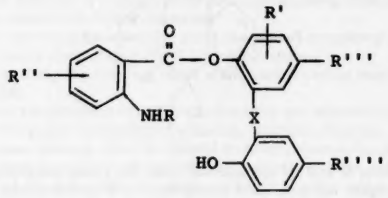
3,884,959

AROMATIC ESTERS OF ANTHRANILIC ACID

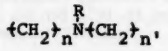
John Howard Adams, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 227,609, Feb. 18, 1972, Pat. No. 3,758,437, which is a continuation-in-part of Ser. No. 102,968, Dec. 30, 1970, abandoned. This application Feb. 13, 1973, Ser. No. 331,717
Int. Cl. C07c *101/54*, *149/42*
U.S. Cl. 260—471 R **3 Claims**

1. Ester of anthranilic acid having the following structure:



in which
R is H or an alkyl group of 1 to 4 carbon atoms,
R′ and R″ are H, NO_2, alkyl groups of 1 to 20 carbon atoms or halogen,
R‴ is an alkyl group of 5 to 20 carbon atoms either straight or branched chain in structure,
R⁗ is H or an alkyl group of 1 to 20 carbon atoms, and
X is $+S+_n$, or



where *n* and *n*′ are the same or different and have a value from 1 to 5.

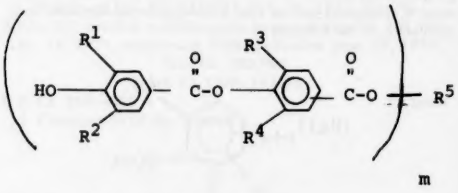
3,884,960

POLYOL ESTERS OF ALKYL SUBSTITUTED HYDROXY-BENZOYLOXYBENZOIC ACIDS

John J. Spivack, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 26, 1972, Ser. No. 318,326
Int. Cl. C07c *69/76*
U.S. Cl. 260—473 S **8 Claims**

1. A benzoyloxybenzoate having the formula



wherein
R^1, R^2, R^3, and R^4 are independently lower alkyl groups.
R^5 is alkylene or oxyalkylene derived from ethylene glycol, 1,2 and 1,3-propylene glycols, 1,10-decanediol, 2,2,4-trimethylhexanediol, diethylene glycol, neopentylglycol, trimethylolethane, glycerol, pentaerythritol, 1,2,3,4-tetrahydroxybutane, and
m is an integer from 2 and 4.

3,884,961

BIS-(SUBSTITUTED BENZYL) MALONIC ACID ESTERS

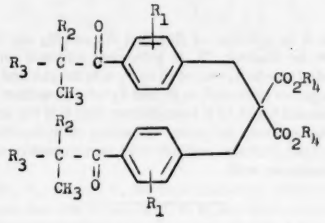
William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz-Wander, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 403,225, Oct. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 333,892, Feb. 20, 1973, abandoned. This application Dec. 4, 1973, Ser. No. 421,673

Int. Cl. C07c *69/76*

U.S. Cl. 260—475 SC 4 Claims

1. A compound of the formula



where

R_1 represents hydrogen, fluoro or chloro or straight chain lower alkoxy, and

R_2 and R_3 each independently represent lower alkyl having 1 to 2 carbon atoms, and

R_4 each independently represents lower alkyl having 1 to 4 carbon atoms.

3,884,962

PHENYLCARBAMATES

Richard C. Koch, Niantic, Conn., and Hugh C. Richards, Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

Filed June 21, 1973, Ser. No. 372,023

Claims priority, application United Kingdom, June 29, 1972, 30396/72

Int. Cl. C07c *125/06*

U.S. Cl. 260—479 C 10 Claims

1. A compound selected from the group consisting of 4-(4-bromophenylthio)-3,5-dimethylphenyl N-methyl-carbamate, 4-(4-chlorophenylthio)-3,5-dimethylphenyl N-methyl-carbamate, 3,5-dimethyl-4-phenylthiophenyl N-methyl-carbamate, 4-(4-chlorophenylthio)-3,5-dimethylphenyl N-acetyl-N-methyl-carbamate, 4-(4-bromophenylthio)-3,5-dimethylphenyl N-acetyl-N-methylcarbamate, 3,5-dimethyl-4-phenylthiophenyl N-acetyl-N-methylcarbamate, 4-(4-chlorophenylthio)-3,5-dimethylphenyl N-methyl-N-propionyl-carbamate, 4-(4-chlorophenylthio)-3,5-dimethylphenyl N-methyl-N-(n-butyryl)-carbamate and 4-(4-chhlorophenylthio)-3,5-dimethylphenyl N-methyl-N-isobutyryl-carbamate.

3,884,963

ADDITION OF N,N-DICHLORO-N-ACYL COMPOUNDS TO DIENES

Francis A. Daniher, Westfield, and Alexis A. Oswald, Mountainside, both of N.J., assignors to Exxon Research & Engineering Company, Linden, N.J.

Filed Dec. 6, 1967, Ser. No. 688,308

Int. Cl. C07c *125/06*

U.S. Cl. 260—482 C 27 Claims

1. A selective monoaddition process for the preparation of C_1 to C_{30} alkyl N-chloro-N-(4-chlorocrotyl-1) carbamate compounds, comprising reacting a C_1 to C_{30} N,N-dichloro alkyl carbamate compound with a C_4 to C_{30} conjugated diene at a temperature of between about −80° and about 100°C. and pressures about 1 and about 10 atmospheres in the liquid phase in the absence of added catalyst.

12. Compounds according to claim 11 wherein R_1 is methyl, ethyl, propyl and R_2 to R_7 are hydrogen, chlorine, fluorine, methyl.

3,884,964

PIGMENT DISPERSANT IN AQUEOUS SLURRIES

Joseph V. Otrhalek, Dearborn, Mich., and Gunther H. Elfers, Mutterstadt, Germany, assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 31, 1974, Ser. No. 438,336

Int. Cl. C07c *69/54*

U.S. Cl. 260—486 R 8 Claims

1. A composition for controlling the viscosity of pigments in an aqueous slurry consisting essentially of an alkali neutralized terpolymer produced by the free radical polymerization in water of

a. from about 60 to 88 parts by weight of at least one alpha, beta unsaturated carboxylic acid containing 3 to 4 carbon atoms.

b. from about 6 to 28 parts by weight of at least one alkylate of an alpha, beta unsaturated carboxylic acid containing 3 to 4 carbon atoms, said alkylate containing from 1 to 18 carbon atoms, and

c. from about 4.5 to about 20 parts by weight of allyl alcohol.

the total of said parts being 100.

3,884,965

VICINAL GLYCOL ESTER PURIFICATION PROCESS

John Kollar, Wyckoff, N.J., assignor to Halcon International, Inc., New York, N.Y.

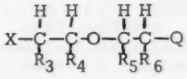
Continuation-in-part of Ser. No. 220,889, Jan. 26, 1972, abandoned. This application Apr. 30, 1973, Ser. No. 355,843

Int. Cl. C07c *67/06*

U.S. Cl. 260—499 18 Claims

1. A process for purification of C_1–C_3 hydrocarbon carboxylic acid esters of [C_2-C_3] vicinal ethylene and propylene glycols containing less than 5 wt. % water, said esters containing organic halogen compound impurities predominating in at least one member of the group consisting of:

and



wherein:

X is chlorine, bromine or iodine;

Q is a radical selected from the group consisting of chlorine, bromine, iodine, hydroxy and C_1–C_5 alkanoyloxy; and,

R_1 through R_6 inclusive are independently selected from the group consisting of hydrogen and methyl with the total number of carbon atoms of R_1 plus R_2 being either zero or one, the total number of carbon atoms of R_3 through R_6 inclusive being an integer from zero to two, R_3 and R_4 not both being methyl and R_5 and R_6 not both being methyl;

said purification process comprising the steps of:

a. Contacting at a temperature between about 50° C. and about 400°C. said impurity-containing vicinal glycol ester, the ester being in the liquid phase, with at least one metal compound selected from the group consisting of the aquobasic alkali metal compounds, aquobasic alkaline earth metal compounds and compounds other than the halides selected from the group consisting of oxides, hydroxides, carbonates, bicarbonates, salts of mineral acids having a pK in 0.1N water solution at 25°C. of 3.0 or more, salts with alkyl monobasic hydrocarbon carboxylic acids having up to 20 carbon atoms, salts with naphthenic acids of up to 20 carbon atoms, salts with benzoic acid and salts with lower alkyl-substituted benzoic acids of zinc, lead, cadmium, tin, mercury, silver, manganese, copper, nickel, cobalt, iron and chromium, the ratio of total equivalents of metal to total equivalents of halogen during such contact being in excess of 1:1;

b. Maintaining the ester in contact with the metal compound for a time sufficient to permit reaction between the metal compound and the organic halogen compound impurities, the time being in excess of 1 minute; and,

c. Separating the vicinal glycol ester, having a reduced quantity of organo-halogen compound impurity, from metal compounds.

3,884,966
PHENENTHRENE SALTS OF α,γ-DIHYDROXY-β-β,DIMETHYLBUTYRIC ACID

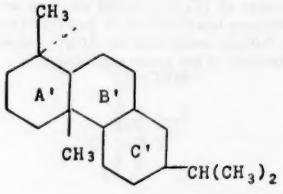
Sidney Frank Schaeren, Bottmingen, Switzerland, assignor to Hoffmann-LaRoche Inc., Nutley, N.J.

Filed Apr. 12, 1966, Ser. No. 541,976
Int. Cl. C07c *87/42*
U.S. Cl. 260—501.1 **19 Claims**

1. A salt of α,γ-dihydroxy-β,β-dimethylbutyric acid of the formula:

$$[HOCH_2C(CH_3)_2CHOHCO_2]^- \ {}^+H_3N(CH_2)_nX$$

wherein *n* is an integer having a value of from 0 to 1 inclusive and X is a radical of the formula:



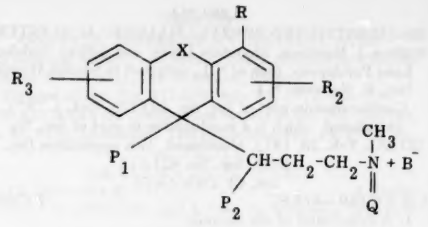
wherein the phenanthrene nucleus is selected from the group consisting of octahydrophenanthrene having an aromatic C′ ring, Δ^8-dodecahydrophenanthrene and perhydrophenanthrene.

3,884,967
TRICYCLIC AMINES AND PROCESSES FOR THE PREPARATION THEREOF

Emilio Kyburz, Reinach, and Hans Spiegelberg, Basel, both of Switzerland, assignors to Hoffmann-LaRoche Inc., Nutley, N.J.

Division of Ser. No. 107,499, Jan. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 679,644, Nov. 1, 1967, abandoned. This application Mar. 8, 1974, Ser. No. 449,405
Int. Cl. C07c *119/00*
U.S. Cl. 260—501.1 **1 Claim**

1. A compound of the formula



wherein R is chlorine or fluorine, R_2 and R_3 are hydrogen, chlorine or fluorine, X is ethylene, vinylene or a halo-substituted vinylene, one of P_1 or P_2 is hydrogen and the other is hydrogen or hydroxyl, or P_1 and P_2 taken together represent an additional bond, Q is benzylidene, and B is the anion of an acid selected from the group consisting of hydrochloric acid, sulfuric acid, methane-sulfonic acid, benzenesulfonic acid and toluenesulfonic acid.

3,884,968
N-2,4-DIMETHYLPHENYL-N′-METHYLFORMAMIDINE COMPOUNDS

Ian Robert Harrison, Bleasby; John Felix McCarthy, Bramcote Hills, and Bryan Harper Palmer, Burton Joyce, all of England, assignors to Boots Pure Drug Company, Nottingham, Great Britain

Division of Ser. No. 94,208, Dec. 1, 1970, Pat. No. 3,729,565. This application Dec. 8, 1972, Ser. No. 313,234
Claims priority, application United Kingdom, Dec. 12, 1969, 60793/69; May 14, 1970, 23500/70
Int. Cl. C07c *129/00*
U.S. Cl. 260—501.14 **3 Claims**

1. N-2,4-dimethylphenyl-N′-methylformamidine addition salts of (pesticidally acceptable) acids selected from the group consisting of hydrobromic, hydriodic, hydrofluoric, sulphuric, nitric, phosphoric, perchloric, sulphamic, formic, acetic, trichloroacetic, oxalic, picric, benzenesulphonic, and p-toluenesulphonic acids.

3,884,969
NOVEL PROSTAGLANDINS

Robert Eugene Schaub, Upper Saddle River, and Martin Joseph Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 20, 1973, Ser. No. 353,152
Int. Cl. C07c *61/36, 69/74*
U.S. Cl. 260—514 D **28 Claims**

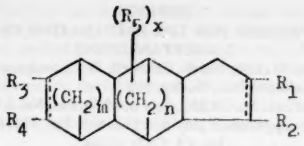
1. 1-9-Oxo-15-hydroxy-16-methyl-18,20-ethano-13-trans-prostenoic acid and the pharmaceutically acceptable cationic salts thereof.

3,884,970
RESINOUS CARBOXYLIC ACID DERIVATIVES

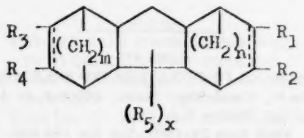
Morimasa Arakawa, Ashiya; Akisato Katanosaka, Toyonaka; Manabu Hanamoto, Nishinomiya, and Jyunichiro Ohtsubo, Izumi, all of Japan, assignors to Nard Institute, Ltd., Japan

Filed Sept. 19, 1973, Ser. No. 398,780
Claims priority, application Japan, Sept. 21, 1972, 47-95517; Dec. 1, 1972, 47-120825; Dec. 29, 1972, 47-453; May 10, 1973, 48-52274
Int. Cl. C07c *61/12, 61/28, 69/74*
U.S. Cl. 260—514 G **7 Claims**

1. A resinous condensed cyclic alkane or alkene carboxylic acid derivative of the general formula:



or



wherein R_1, R_2, R_3 and R_4 are each carboxyl, alkoxycarbonyl or hydrogen but one or two of R_1 to R_4 are always carboxyl or alkoxycarbonyl of which the alkoxy moeity has 1 to 6 carbon atoms and, when more than one carboxyl or alkoxycarbonyl is present, they can not be present at the adjacent positions; R_5 is alkyl having 1 to 6 carbon atoms which may be present at any position from the 1- to 9a-positions; *m* and *n* are each an integer of 0 or 1 but at least one of them is 1; *x* is an integer of 0 to 3; and not more than one double bond may be present between the positions indicated by a dotted line and, when present, carboxyl or alkoxycarbonyl can not exist at such positions.

3,884,971

REDUCTION OF CARBONYL COMPOUNDS

Theodore P. Goldstein, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 22, 1971, Ser. No. 191,806

Int. Cl. C07c *59/08*

U.S. Cl. 260—535 R **20 Claims**

1. A process of reducing carbonyl compounds comprising reacting an alpha-keto acid compound with a heterocyclic nitrogen compound containing a reduced pyridine group in the presence of a polyvalent metal ion of a metal selected from the group consisting of Groups IIB, IVA, VIIB and VIII of the Periodic Table, said reaction being carried out at a pH of from about 4 to about 10.

3,884,972

TRIS (2-CHLOROETHYL)PHOSPHORAMIDE— A CROSSLINKING AGENT FOR CELLULOSIC COMPOSITIONS

Earl J. Roberts, New Orleans; Mary Ann F. Brannan, Metairie, and Stanley P. Rowland, New Orleans, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 24, 1970, Ser. No. 49,551

Int. Cl. C07f *9/22*

U.S. Cl. 260—551 P **1 Claim**

1. Tris(2-chloroethyl)phosphoramide.

3,884,973

BUTANONE SEMICARBAZONE

Hamish Christopher Swan Wood, Gearson, and Alexander Stuart, Bromley, both of England, assignors to The University of Strathclyde, Glasgow C.1, Scotland

Division of Ser. No. 160,216, July 6, 1971, Pat. No. 3,725,408, which is a division of Ser. No. 794,786, Jan. 28, 1969, Pat. No. 3,635,978. This application Oct. 31, 1972, Ser. No. 302,509

Int. Cl. C07c *133/02*

U.S. Cl. 260—554 **2 Claims**

1. 3-Amino-1-hydroxy-3-methylbutan-2-one semicarbazone.

2. The hydrochloride salt of 3-amino-1-hydroxy-3-methylbutan-2-one semicarbazone.

3,884,974

2-KETOAMIDINES

Wilhelm Heffe, Neuenegg, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

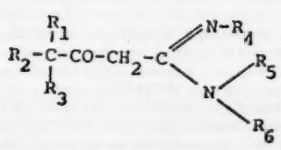
Continuation-in-part of Ser. No. 366,681, June 4, 1973. This application Dec. 13, 1973, Ser. No. 426,714

Claims priority, application Switzerland, June 7, 1972, 8443/72; Feb. 28, 1973, 2917/73

Int. Cl. C07c *123/00*

U.S. Cl. 260—564 R **97 Claims**

1. A compound of the formula:



wherein

R_1 is alkyl of 1 to 4 carbon atoms, phenyl, substituted with halo or alkyl of 1 to 4 carbon atoms, and

R_2 is alkyl of 1 to 4 carbon atoms, or

R_1 and R_2 together are $-(CH_2)_n-$, wherein *n* is an integer from 2 to 7,

and

R_3 is alkyl of 1 to 4 carbon atoms,

R_4 is alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, and

R_5 and R_6 are the same or different and each is alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, or one of R_4, R_5 and R_6 is phenyl or phenyl substituted with halo or alkyl of 1 to 4 carbon atoms and the others of R_4, R_5 and R_6 are as defined above,

or a salt thereof of a pharmaceutically acceptable acid.

3,884,975

RHODIUM CATALYST FOR HYDRATION OF ACRYLONITRILE

Anthony Joseph Fanelli, and Francis Clyde Rauch, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 5, 1972, Ser. No. 296,363

Int. Cl. C07c *103/08*

U.S. Cl. 260—561 N **5 Claims**

1. In a process for producing acrylamide by the catalytic hydration reaction of acrylonitrile with water in a liquid homogeneous solution with a catalytic amount of homogeneous catalyst which comprises a member selected from the group consisting of diaryl phosphine oxides and which also comprises a compound of rhodium that is capable of forming a coordination complex with said phosphine oxide, the improvement wherein there is also present in said liquid homogeneous solution a catalytic amount of a soluble mercuric compound.

3,884,976
7-AMINO NORBORNANE DERIVATIVES

Karl Bernauer, Allschwil; Janos Borgulya; Marc Montavon, both of Basel, all of Switzerland; Hermann Breitschneider; Kraft Hohenlohe-Oehringen, both of Innsbruck, Austria, and Gunter Weis, Igls, Austria, assignors to Hoffmann-LaRoche Inc., Nutley, N.J.

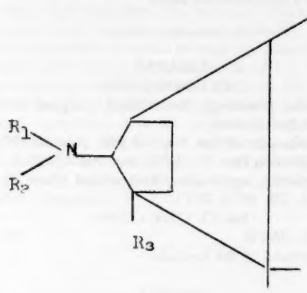
Filed July 30, 1973, Ser. No. 383,953

Claims priority, application Switzerland, Aug. 10, 1972, 11844/72

Int. Cl. C07c *87/40*

U.S. Cl. 260—563 P 12 Claims

1. A compound of the formula



wherein R_1 and R_2 each is hydrogen, lower alkyl, or lower alkenyl or R_1 and R_2 together with the nitrogen atom to which they are attached are a 5-membered or 6-membered heterocyclic group selected from the group consisting of pyrnolidino, piperidino, lower alkyl pyrrolidino and lower alkyl piperidino and pyrrolidino, 3 is hydrogen or methyl or an optically active enantiomer or a pharmaceutically acceptable acid addition salt thereof.

3,884,977
ANTIBACTERIAL QUATERNARY AMMONIUM SALTS AND METHOD OF PREPARING THE SAME

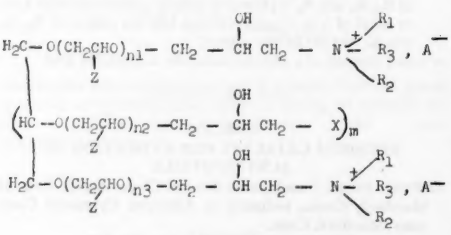
Nicholas M. Molnar, 215 E. 68th St., New York, N.Y. 10021

Filed Feb. 3, 1972, Ser. No. 223,308

Int. Cl. C07c *91/02*

U.S. Cl. 260—567.6 P 6 Claims

1. A quaternary ammonium salt of the following general structure:



wherein R_1 and R_2 are alkyl groups each having 1 to 3 carbon atoms,

R_3 is alkyl or alkenyl containing 8 to 18 carbon atoms,

Z is hydrogen or CH_3,

X is chlorine or bromine,

A is chosen from the group of chloride, bromide, iodide, paratoluene sulfonate or any other physiologically acceptable anion,

n_1, n_2 and n_3 are integers ranging from 1 to 10, and m has the value of 1 or 2.

3,884,978
PROCESS FOR THE PREPARATION OF 2,6-HEPTANEDIONE

Pius Anton Wehrli, North Caldwell, N.J., assignor to Hoffmann-LaRoche Inc., Nutley, N.J.

Division of Ser. No. 53,281, July 8, 1970, Pat. No. 3,767,677. This application July 9, 1973, Ser. No. 377,495

Int. Cl. C07c *49/04*

U.S. Cl. 260—593 R 5 Claims

1. A process for the preparation of 2,6-heptanedione which process comprises reacting diketene with formaldehyde in water at a temperature in the range of about 0° to about 100°C.

3,884,979
SYNTHESIS OF UNSATURATED DIKETONES

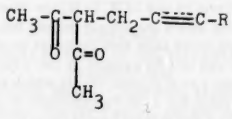
George Buchi, Cambridge, Mass., assignor to Hoffmann-LaRoche Inc., Nutley, N.J.

Filed June 29, 1971, Ser. No. 158,080

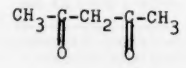
Int. Cl. C07c *49/20*, *49/46*

U.S. Cl. 260—593 R 1 Claim

1. A process for preparing a compound of the formula:



wherein R is hydrogen, lower alkyl containing from 1 to 7 carbon atoms, or lower alkenyl containing from 2 to 7 carbon atoms, and the dotted bond can be optionally hydrogenated; comprising reacting a compound of the formula:



with a hydroxy compound of the formula:

YO—CH_2—C C—R

wherein R is as above; —OY is p-toluenesulfonyloxy and lower alkylsulfonyloxy and the dotted bond can be optionally hydrogenated;

in the presence of a base selected from the group consisting of tri(lower alkyl)amines and pyridine in an aqueous medium containing a lower alkanol.

3,884,980
ALDOL CONDENSATION USING COBALT II HALIDE HYDRAZINE COMPLEXES

Christian H. Stapfer, Newton, and Richard W. D'Andrea, New Hope, both of Pa., assignors to Cincinnati Milacron Chemicals, Inc., Reading, Ohio

Division of Ser. No. 26,161, April 6, 1970, Pat. No. 3,728,087. This application Sept. 16, 1971, Ser. No. 181,214

Int. Cl. C07c *45/00*, *49/04*

U.S. Cl. 260—586 C 9 Claims

1. In a process of forming a polymer by aldol condensation of a ketone the improvement consisting essentially of heating a composition comprising (a) a compound having one of the formulae:

(1) [Co (II) (R-$NHNH_2$)$_3$] X_2

(2) [Co (II) (N_2H_4.HX)$_3$] X_2 and

(3) [Co (II) (R—$NHNH_2$)$_2$] X_2

where R is H. alkyl, aralkyl, aryl or haloaryl and X is halogen as a catalyst and (b) said ketone as solvent for said compound (a) until polymerization of the ketone occurs, wherein the ketone is selected from the group consisting of acetone, methyl ethyl ketone, methyl amyl ketone, isophorone, diethyl ketone, di-n-propyl ketone, diisopropyl ketone, di-n-butyl

ketone, diisobutyl ketone, di sec butyl ketone, di-n-amyl ketone, methyl-n-propyl ketone, pinacolone, 6-methyl-2-heptanone, methyl n-octyl ketone, ethyl n-butyl ketone, 1-hydroxy-2-propanone, 3-hydroxy-2-butanone, diacetone alcohol, cyclobutanone, cyclohexanone, 2-methyl cyclohexanone, cycloheptanone, fenchone, acetophenone, biacetyl, acetyl propionyl, acetyl acetone, mesityl oxide and hexanone-3.

3,884,981

VAPOR PHASE HYDROGENOLYSIS DEHYDROGENATION PROCESS

Ben W. Kiff, Ona, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 27, 1972, Ser. No. 318,708
Int. Cl. C07c *45/18*

U.S. Cl. 260—595 **4 Claims**

1. A process for the production of methyl ethyl ketone from normally-liquid oxygenated products comprising sec-butanol and sec-butyl acetate which comprises:

i. reacting a vaporous mixture of said oxygenated products with hydrogen,

ii. at an elevated temperature in the range of from about 300° to about 450°C.,

iii. in the presence of a catalyst consisting essentially of (a) an oxide of chromium, (b) an oxide of manganese, and (c) an oxide of at least one metal of the group consisting of zinc and nickel, said metal oxides being predominately in their lower oxidation states, the molar ratios of both manganese to chromium and said metal to chromium being in the range of from about 0.3:1.0 to about 1.5:1.0, and

iv. from about 1 to about 5 moles of hydrogen per mol of sec-butyl acetate contained in said oxygenated products,

v. for a period of time sufficient to convert said sec-butanol and said sec-butyl acetate to methyl ethyl ketone, said period being less than about 30 seconds, and

vi. recovering methyl ethyl ketone from the reaction product mixture;

wherein said normally-liquid oxygenated products comprise from about 5 to about 30 weight percent sec-butanol and from about 10 to about 50 weight percent sec-butyl acetate.

3,884,982

PROCESS FOR PREPARING CHLOROMETHYL METHYL ETHER

Lawrence A. Ens, Ann Arbor, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed July 19, 1973, Ser. No. 380,777
Int. Cl. C07c *41/00, 41/10*

U.S. Cl. 260—614 R **9 Claims**

1. An improved process for preparing chloromethyl methyl ether containing a reduced level of bischloromethyl ether comprising:

A. Saturating methanol, methylal or a liquid mixture thereof with HCl under essentially anhydrous conditions;

B. Adding formaldehyde at a controlled rate consistent with maintaining a reaction temperature between about −10°C and 45°C together with sufficient anhydrous HCl to maintain an essentially HCl saturated reaction mixture until about 0.6 to 1.0 equivalent of formaldehyde per equivalent of methanol has been added; and then

C. Recovering chloromethyl methyl ether from the reaction mixture.

3,884,983

PROCESS FOR THE PRODUCTION OF PHOTOGRADE HYDROQUINONE

Ward J. Burkholder, Houston; Glenn E. Miller, Pasadena, and Ronald C. Hays, Houston, all of Tex., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 19, 1970, Ser. No. 65,135
Int. Cl.² C07C *37/22*

U.S. Cl. 260—621 A **6 Claims**

1. In a method for the recovery of crystalline photograde hydroquinone wherein a rearranged effluent obtained by the acid catalyzed rearrangement of paradiisopropylbenzene dihydroperoxide in a rearrangement solvent is neutralized and the rearrangement solvent removed and wherein there is obtained from the rearrangement solvent-free product an organic phase and a neutralized, dilute aqueous product containing said hydroquinone, the improvement comprising:

a. concentrating the dilute aqueous product by evaporating water therefrom at a temperature of from about 170° to 220°F,

b. carbon treating the concentrated hydroquinone solution from step (a),

c. cooling the carbon treated hydroquinone solution in a crystallizer vessel to effect crystallization of the hydroquinone from said aqueous solution,

d. separating the crystallized hydroquinone from step (c),

e. maintaining the aqueous product under a reducing environment throughout the hydroquinone recovery operation by excluding air from the process streams and injecting sodium bisulfite into the process stream at the commencement of the recovery process step.

3,884,984

PROCESS FOR OXIDIZING OLEFINS

Isao Hirose; Kazutoshi Funabashi; Takeshi Fujii, all of Iwakuni, and Kiyoshi Kawajiri, Hiroshima-ken, all of Japan, assignors to Teijin Ltd., Osaka, Japan

Continuation of Ser. No. 56,871, July 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 615,432, Feb. 13, 1967, abandoned. This application May 16, 1973, Ser. No. 360,684
Int. Cl. C07c *29/04*

U.S. Cl. 260—634 **8 Claims**

1. A process for the preparation of an alkylene chlorohydrin, bromo-hydrin or mixture thereof, having 2 to 4 carbon atoms, which comprises contacting an unsubstituted monoolefin having 2 to 4 carbon atoms with an aqueous solution containing chlorine ions, bromine ions or a mixture thereof, and thallic ions (Tl III) said chlorine ion and bromine ion being derived from at least one compound selected from hydrogen chloride, hydrogen bromide, thallium chloride, thallium bromide, chlorides and bromides of redox metals, chlorides and bromides of alkali metals or chlorides and bromides of alkaline earth metals, and said thallic ions (Tl III) being derived from a thallium salt which is soluble in the reaction system at a temperature of from room temperature to 180°C. and at a partial pressure of the olefin above 5 atmospheres, the atomic ratio of said chlorine ions, bromine ions or mixture theeof, to thallic ions being at least 6:1, and recovering by extraction, distillation, azeotropic distillation or flash evaporation, the resulting alkylene chloro-hydrin, bromohydrin or mixture thereof.

3,884,985

METHOD OF SEPARATING SULFUR MONOCHLORIDE FROM CARBON TETRACHLORIDE

Kenneth P. Hoffman, Niagara Falls, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 15, 1973, Ser. No. 406,457
Int. Cl. C07c *17/38*

U.S. Cl. 260—664 **7 Claims**

1. A process for recovering sulfur monochloride from a mixture containing sulfur monochloride and carbon tetrachlo-

ride derived from a process for preparing carbon tetrachloride by the chlorination of carbon disulfide which comprises; contacting the mixture containing sulfur monochloride and carbon tetrachloride with a substantially dry inert gas at a temperature between about 70° and about 150°C. to separate carbon tetrachloride from the sulfur monochloride.

3,884,986

CATALYTIC CONVERSION OF POLYCYCLIC AROMATIC HYDROCARBONS IN THE PRESENCE OF HYDROGEN

Ronald D. Bushick, Glen Mills, and Alfred E. Hirschler, Springfield, both of Pa., assignors to Sun Ventures, Inc., Marcus Hook, Pa.

Continuation of Ser. No. 118,177, Feb. 23, 1971, Pat. No. 3,776,968, Continuation-in-part of Ser. No. 749,932, Aug. 5, 1968, Pat. No. 3,565,964. This application Dec. 3, 1973, Ser. No. 420,988The portion of the term of this patent subsequent to Feb. 23, 1988, has been disclaimed.

Int. Cl. C07c *15/28*

U.S. Cl. 260—668 F **16 Claims**

1. Process for converting a polycyclic aromatic hydrocarbon containing at least one saturated ring to an isomer, or the conversion of said isomer to said polycyclic aromatic hydrocarbon, said process comprising contacting a feed rich in said polycyclic aromatic hydrocarbon, or rich in the said isomer with an acidic alumino-silicate catalyst in the presence of from 5–1500 p.s.i. of hydrogen at a temperature above 40°C. but below cracking temperature, whereby isomerization of the contacted isomer to the other isomer occurs.

3,884,987

PRODUCTION OF DEALKYLATED AROMATIC HYDROCARBONS AND HYDROGEN

Masao Uchiyama, and Shoichiro Mori, both of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Dec. 1, 1972, Ser. No. 311,431

Claims priority, application Japan, Dec. 29, 1971, 47-3448

Int. Cl. C07c *3/58*

U.S. Cl. 260—672 R **18 Claims**

1. A process for producing dealkylated aromatic hydrocarbons and hydrogen by steam dealkylation of alkylaromatic hydrocarbons which comprises subjecting a hydrocarbon oil to catalytic steam dealkylation at a reaction temperature of from 350° to 600°C and at a pressure ranging from atmospheric pressure to 50 kg/cm².G in the presence of a nickel-based catalyst containing a catalytic amount of nickel and a catalytically effective amount of thorium, said hydrocarbon oil containing at least 50% by weight of an alkylaromatic hydrocarbon and the remainder consisting essentially of non-aromatic hydrocarbons and having an initial boiling point higher than that of the dealkylated aromatic hydrocarbon to be produced by at least 5°C, the mole ratio of steam to the hydrocarbon oil during the steam dealkylation being less than 20 and recovering the dealkylated aromatic hydrocarbon and hydrogen from the resulting products.

3,884,988

PRODUCTION OF SYNTHETIC LUBRICANTS FROM ALPHA-OLEFINS THROUGH A TERNARY CATALYTIC SYSTEM

Pierleone Girotti; Renato Tesei, and Telemaco Floris, all of San Donato Milanese, Italy, assignors to Snamprogetti S.p.A., San Donato Milanese, Italy

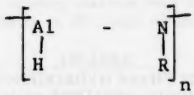
Filed Feb. 15, 1973, Ser. No. 332,627

Claims priority, application Italy, Feb. 15, 1972, 20564/72

Int. Cl. C07c *3/10*

U.S. Cl. 260—683.15 D **8 Claims**

1. Process for the preparation of high quality lubricating oils through the polymerization of a member of the group consisting of pure normal alpha-olefins and of mixtures of commercial alpha-olefins having the general formula $R - CH = CH_2$, in which R is an alkyl radical containing from 2 to 16 carbon atoms, wherein the catalytic system used for effecting the polymerization is a catalyst consisting of a compound of a transition metal selected from the group consisting of $TiCl_4$, $TiCl_3$, VCl_4 and $VOCl_3$ and two anionic coordinate cocatalysts, consisting, respectively, of: (a) a linear polymer constituted by a polyiminic compound having the following general formula



wherein n is a whole number not higher than 50 and R is an alkyl or cycloalkyl radical; and (b) a member of the group consisting of an aluminum alkyl sesquichloride an aluminum dialkyl mono chloride, and an aluminum monoalkyl dichloride the ratio between compound (a) and compound (b) is from 60/40 to 90/10 and the ratio between compound (a) and the transition metal compound is from 1.1 to 1.7.

3,884,989

COMPOSITION, PROCESS AND ARTICLE

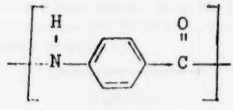
Richard N. Blomberg, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 747,123, July 24, 1968, abandoned. This application Jan. 20, 1971, Ser. No. 108,216The portion of the term of this patent subsequent to Mar. 28, 1989, has been disclaimed.

Int. Cl. C08g *41/04*

U.S. Cl. 260—857 R **3 Claims**

1. Fiber consisting essentially of a first solid phase consisting essentially of a synthetic organic fiber-forming matrix polymer selected from the group consisting of polyamides, polyesters, spandex polymers, and polyacrylics, and a second solid phase distributed throughout said matrix polymer and present in a reinforcing amount of from about 1% up to about 25% by weight, based upon the weight of said matrix polymer, consisting essentially of recurring units of the formula:



wherein said reinforcing polymer is in the form of solid acicular particles having a length of less than about 10 microns, having a length-to-width ratio greater than about 2:1.

3,884,990

AROMATIC CO-POLYESTER COMPOSITION CONTAINING POLYETHYLENE OXYBENZOATE AND AROMATIC PHENOLIC POLYESTER

Hiroshi Sakata; Nakaba Asahara; Yasuhiko Asai, and Hirozo Hasegawa, all of Kyoto, Japan, assignors to Unitika, Ltd., Amagasaki, Japan

Filed May 16, 1974, Ser. No. 470,485

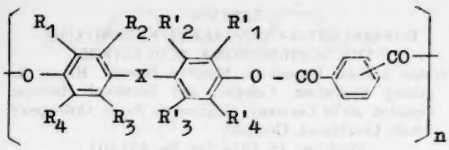
Claims priority, application Japan, May 18, 1973, 48-55297

Int. Cl. C08g *39/10*

U.S. Cl. 260—860 **23 Claims**

1. A composition comprising an aromatic co-polyester and poly(ethylene oxybenzoate), in which

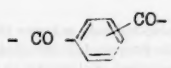
a. the aromatic co-polyester is a resinous product represented by the formula:



wherein X is —O—, —S—, $—SO_2—$, an alkylene group or an alkylidene group; R_1, R_2, R_3, R_4, R_1', R_2', R_3' and R_4' which may be the same or different, each is a hydrogen atom, a chlorine atom, a bromine atom or a hydrocarbon group having 1 to 6 carbon atoms, and *n* is a positive integer which provides a resinous product;

b. the poly(ethylene oxybenzoate is present in an amount of from 0.1 to 50 weight % based on the sum of the weight of said aromatic co-polyester and the poly(ethylene oxybenzoate); and

c. the



moiety in the above formula is a terephthalic acid unit or an isophthalic acid unit, which is present in said aromatic co-polyester at a molar ratio of 9:1 to 1:9, respectively.

3,884,991

GRAFT-POLYMER OF VINYL CHLORIDE AND PRODUCING PROCESS THEREOF

Yujiro Kosaka; Masaru Uemura; Mitsutaka Saito; Yuji Suzuki, and Kunio Takamoto, all of Shinnanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Continuation-in-part of Ser. No. 876,577, Nov. 13, 1969, abandoned. This application Nov. 18, 1971, Ser. No. 200,199

Claims priority, application Japan, Nov. 11, 1968, 43-85481

Int. Cl. C08f *15/02, 15/24, 15/30*

U.S. Cl. 260—878 R **1 Claim**

1. A graft copolymer blend comprising

a. polyvinylchloride grafted onto chlorinated ethylene vinyl acetate copolymer, and

b. polyvinyl chloride,

said blend containing 5 to 25% by weight of said chlorinated ethylene vinyl acetate, said chlorinated ethylene vinyl acetate containing 15 to 45% by weight chlorine; said chlorinated ethylene vinyl acetate, prior to chlorination, containing 50 to 97% by weight of combined ethylene and having a melt index of 0.1 to 500g/10 min., said blend being prepared by reacting 15 to 35 parts by weight of said chlorinated ethylene vinyl acetate with 326 to 370 parts by weight vinyl chloride in the presence of a radical initiator at a temperature of 30° to 80° C.

3,884,992

THERMOSETTING RESIN CONTAINING EPOXY RESIN AND POLYHYDROXYSTYRENE

Masaru Shimizu, Kanagawa; Hiroshi Fujiwara, Saitama, and Shinji Iwai, Kanagawa, all of Japan, assignors to Maruzen Oil Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1973, Ser. No. 411,874

Claims priority, application Japan, Nov. 1, 1972, 47-109675

Int. Cl. C08g *45/04*

U.S. Cl. 260—837 R **17 Claims**

1. A thermosetting resin composition comprising a polyhydroxystyrene having a degree of polymerization of from 4 to 70,000 and an epoxy resin comprising an epoxy compound having at least 2 epoxy groups per molecule, wherein the ratio of the number of hydroxyl groups in said polyhydroxystyrene to the number of epoxy groups in said epoxy resin is in the range of 0.5 – 5.0.

3,884,993

EPM AND EPDM RUBBERS HAVING IMPROVED PROCESSABILITY

Harold J. Gros, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.

Continuation of Ser. No. 109,191, Jan. 25, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 348,902

Int. Cl. C08f *37/18*

U.S. Cl. 260—897 A **11 Claims**

1. The method of inproving the processability and ozone resistance characteristics of elastomers of ethylene and monoolefin having from 3–16 carbon atoms (EPM) and elastomers of ethylene, a monoolefin having from 3–16 carbon atoms and a polyene (EPDM) comprising blending solution of separately formed low molecular weight and high molecular weight polymers of the respective elastomers, in the ratio of 0.7 to 1.3 parts by weight of the low molecular weight polymer per 1 part by weight of the high molecular weight polymer, in which, for the EPDM elastomeric system, the low molecular weight polymer is an EPDM having a molecular weight average less than 25,000 and the high molecular weight polymer is an EPDM having an average molecular weight measured by Mooney level of ML_{1+8} at 300°F which is greater than 100 and in which, for the EPM elastomeric system, the low molecular weight polymer is an EPM having an average molecular weight of less than 10,000 and the high molecular weight polymer is an EPM having an average molecular weight measured by Mooney level of ML_{1+8} at 300°F which is greater than 90, separating the blended solids by coagulation, and processing the solid blend by milling or extrusion.

3,884,994

GRAFT COPOLYMERS OF LACTONE POLYESTERS

Frank E. Critchfield, and Joseph V. Koleske, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

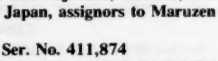
Division of Ser. No. 273,300, July 19, 1972, which is a division of Ser. No. 109,982, July 26, 1971, Pat. No. 3,760,034. This application Feb. 8, 1974, Ser. No. 440,779

Int. Cl. C08f *29/24*

U.S. Cl. 260—899 **8 Claims**

1. Polyblend of polyvinyl chloride and about 10 to about 100 parts of graft copolymer, per hundred of polyvinyl chloride, said graft copolymer comprising:

a. lactone polyesters having a reduced viscosity of about 0.2 to 2.0 dl./gm., a molecular weight of about 5,000 to 150,000 and repeating units having the general formula:



wherein R_1 is H or an alkyl group containing one to about six carbon atoms, and *n* is an integer having a value of at least 3; and

b. graft copolymerized thereon about 1 to about 20% by weight based on the weight of said lactone polyesters of an ethylenically unsaturated monomer having the general formula:

wherein R is a monovalent radical selected from the group consisting of —H and methyl, R′ is a monovalent radical selected from the group consisting of —COOH and —COOR″, and R″ is an alkyl radical containing one to about 18 carbon atoms.

3,884,995

NON-FLOCCULATED DISPERSIONS OF PERFLUOROOLEFIN POLYMER PARTICLES IN ORGANIC LIQUID

Henry K. Seiler, Woodbury, N.J., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed July 18, 1973, Ser. No. 380,335

Int. Cl. C08f *29/22*

U.S. Cl. 260—900 **9 Claims**

1. A process for preparing a dispersion in an organic liquid of particles of perfluoroolefin polymer which comprises:

A. contacting

1. 4–12 volumes of an aqueous dispersion of particles of perfluoroolefin polymer consisting essentially of polymers of tetrafluoroethylene and copolymers of tetrafluoroethylene and hexafluoropropylene the polymer bearing functional groups and the dispersion being substantially free of ionic contaminants that would materially interfere with the reaction described in 3 below,
2. one volume of an organic liquid immiscible with water, and
3. at least about 10% by weight, based on weight of perfluoroolefin polymers, of a stabilizer which is a polymer formed from 99.9–20% by weight, based on the total weight of the stabilizer, of monomers selected from the groups consisting essentially of esters of acrylic acid or methacrylic acid with alkanols of C_1—C_{18}, vinyl esters of fatty acids having 2–20 carbon atoms, styrene, acrylonitrile, methacrylonitrile and mixtures of the foregoing and 0.1–80% by weight, based on the total weight of the stabilizer, of monomer bearing functional groups that will interact with those born by the perfluoroolefin polymer, the stabilizer being present in such an amount and the contacting being done under conditions in which some of the functional groups of the perfluoroolefin polymer and the functional groups of the stabilizer interact thereby causing at least some of the perfluoroolefin polymer particles that have interacted with the stabilizer to be transferred to the organic liquid,

B. decanting up to 95% of the total water present the said percentage of the total water having formed into a separate phase, and

C. separating the organic liquid containing perfluoroolefin polymers particles from the remaining water.

3,884,996

O,O-DIALKYL-1-CYANOALKYL-KETONOXIME-THIONOPHOSPHORIC ACID ESTERS

Walter Lorenz, Wuppertal; Manfred Jautelat, Hilgen; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

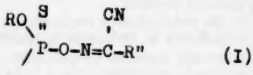
Filed Jan. 15, 1974, Ser. No. 433,603

Claims priority, application Germany, Feb. 1, 1973, 2304848

Int. Cl. C07f *9/16*; **A01n** *9/36*

U.S. Cl. 260—940 **7 Claims**

1. An 0,0-dialkyl-1-cyanoalkyl-ketonoxominethionophosphoric acid ester of the formula



(I)

in which

R and R′ each independently is lower alkyl, and

R″ is n-propyl, iso-propyl, 1,1-dimethyl-propyl or optionally methyl-substituted cyclopentyl or cyclohexyl.

3,884,997

PROCESS FOR PREPARATION OF AROMATIC PHOSPHORUS COMPOUNDS

Howard E. Shook, Jr., Orange, Tex., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 2, 1973, Ser. No. 356,444

Int. Cl. C07f *9/08*, *9/32*, *9/40*

U.S. Cl. 260—973 **6 Claims**

1. In a process for preparing an organic phosphorus compound of the formula $R_xP(OR')_{(3-x)}$ wherein R is an alkyl or aryl radical of 1 to 18 carbon atoms, R′ is an aryl radical of 6–25 carbon atoms and x has a value of 0–2 by maintaining a reaction mixture comprising a phenol and a phosphorus halide of the formula $R_xPX_{(3-x)}$, wherein X is a halide of the group consisting of chloride, bromide and iodide, and R and x are as defined above, at a temperature in the range of about 25°C. to the boiling point of the resulting organic phosphorus compound;

the improvement which comprises incorporating into the reaction mixture when reaction of the phenol with the phosphorus halide is substantially complete at least a stoichiometric amount based on the resultant hydrogen halide in the reaction mixture of a metal selected from the class consisting of zinc, chromium, titanium, cadmium and mixtures thereof and maintaining the reaction mixture at a temperature in the range of 25°C. to the boiling point of the reaction medium for from 0.1 to 2 hours to produce an organic phosphorus compound free of hydrogen halide.

3,884,998

S-DIPHENYLMETHYL-DITHIOPHOSPHATES

Odd Kristiansen, Reinach, Basel-Land, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

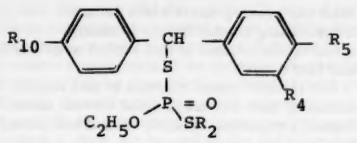
Filed Jan. 28, 1974, Ser. No. 437,414

Claims priority, application Switzerland, Feb. 7, 1973, 1755/73; Dec. 20, 1973, 17773/73

Int. Cl. A01n *9/36*; **C07f** *9/16*

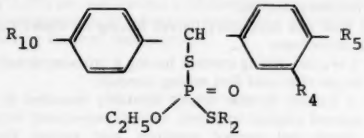
U.S. Cl. 260—948 **8 Claims**

1. A compound of the formula



wherein R_2 represents ethylthiomethyl or propargyl; and each of R_4, R_5 and R_{10} represents hydrogen, chlorine or methoxy.

4. A compound of the formula



wherein R_2 represents n-propyl, n-butyl or isobutyl; and each of R_4, R_5 and R_{10} represents hydrogen or chlorine.

3,884,999

O-ALKYL-S-[3-METHYL-BUTEN-(2)-YL]-(THIONO)THIOL-PHOSPHORIC-(PHOSPHONIC) ACID ESTERS

Gerhard Schrader, Wuppertal Cronenberg, and Ingeborg Hammann, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

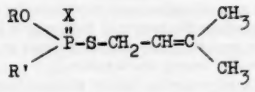
Filed Aug. 15, 1973, Ser. No. 388,678

Claims priority, application Germany, Aug. 26, 1972, 2242097

Int. Cl. C07f 9/16; A01n 9/36

U.S. Cl. 260—956 **7 Claims**

1. A (thiono)thiol-phosphoric-(phosphonic) acid ester of the formula



(I)

in which

R is lower alkyl,

R' is lower alkyl, lower alkoxy, lower alkylmercapto or phenyl, and

X is oxygen or sulfur.

3,885,000

S,S-DIALKYL-O- AND S-ALKENYL PHOSPHITES AND PHOSPHATES

Ernst Beriger, Neuallschwil, and Henry Martin, Basel, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

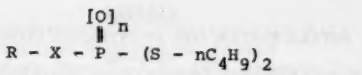
Division of Ser. No. 105,125, Jan. 8, 1971, Pat. No. 3,760,042. This application June 27, 1973, Ser. No. 374,218

Claims priority, application Switzerland, Jan. 16, 1970, 595/70

Int. Cl. C07f 9/16; A01n 9/36

U.S. Cl. 260—956 **4 Claims**

1. A compound of the formula



in which R is alkenyl of from 3 to 6 carbon atoms, X is oxygen or sulphur, and *n* is the number 0 or 1.

3,885,001

MANUFACTURE OF THIOPEROXYDIPHOSPHATES

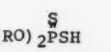
Donald Burrell Graves, Wadsworth, and Otto William Maender, Akron, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 6, 1974, Ser. No. 448,470

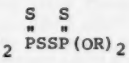
Int. Cl. C07f 9/16

U.S. Cl. 260—968 **11 Claims**

1. A process for converting phosphorodithioic acid of the formula



to thioperoxydiphosphate of the formula



in which R is alkyl of 1–20 carbon atoms, phenyl substituted lower alkyl, cycloalkyl of 5–8 carbon atoms, phenyl, or lower alkyl substituted phenyl which comprises adding to an aqueous solution of alkali metal salt of said phosphorodithioic acid at a pH of 6 or above alkali metal hypohalite and a quantity, equivalent to the major portion of base generated from the hypohalite, of mineral acid or said phosphorodithioic acid.

3,885,002

MANUFACTURE OF TRIALKYLTRITHIOPHOSPHITES AND TRIALKYLPHOSPHOROTHIOATES

F. Taylor Barber, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1973, Ser. No. 355,614

Int. Cl. C07f 9/16

U.S. Cl. 260—972 **9 Claims**

1. A process for the preparation of trialkyltrithiophosphites which comprises the steps of:

reacting under reaction conditions at least one phosphorous trihalide with at least one alkyl mercaptan of 3 to 5 carbon atoms per molecule, thereby producing a first product mixture comprising trialkyltrithiophosphite, and a first off-gas stream comprising hydrogen halide and alkyl mercaptan, wherein said reaction conditions include a temperature in the range of about 125° to 250°F.,

contacting said first off-gas stream with a first strong aqueous caustic solution, thereby substantially absorbing said hydrogen halide and said alkyl mercaptan from said off-gas,

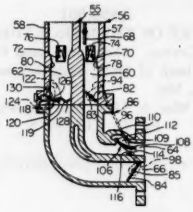
continuing said contacting and absorbing, thereby reducing the pH of said strong caustic containing absorbed alkyl mercaptan to below about 10, whereby said absorbed alkyl mercaptan substantially separates as an alkyl mercaptan phase from said aqueous phase, and

recycling said separated alkyl mercaptan to said reacting step.

3,885,003
INTAKE SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Kazuaki Kobayashi; Tatsujiro Okuno; Shinya Katayama, and Takehiko Kita, all of Tokyo, Japan, assignors to Nissan Motor Company Limited, Japan

Filed Feb. 6, 1974, Ser. No. 439,982
Claims priority, application Japan, Feb. 7, 1973, 48-16937
Int. Cl. F02m *11/02*
U.S. Cl. 261—23 A **4 Claims**

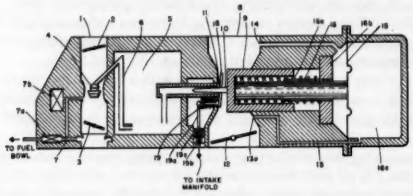


1. An intake system for an internal combustion engine, comprising primary and secondary combustible mixture intake passageways providing communication between the atmosphere and said engine, a primary throttle valve movably disposed in said primary intake passageway, a check valve disposed in said primary intake passageway downstream of said primary intake passageway and near said engine and opening said primary intake passageway only when the pressure on the engine side of said check valve is below that on the opposite side thereof, a secondary throttle valve disposed in said secondary intake passageway near said engine and operatively connected through a linkage to said primary throttle valve to be actuated to open said secondary intake passageway when said primary throttle valve is opened in excess of a predetermined amount, an auxiliary throttle valve disposed in said secondary intake passageway upstream of said secondary throttle valve and actuated to open said secondary intake passageway in response to combustible mixture acting on the surface area of said auxiliary throttle valve, and a fuel port opening into said secondary intake passageway at a position where said auxiliary throttle valve closes said secondary intake passageway.

3,885,004
HIGH VELOCITY CARBURETOR

Frederick J. Marsee, Clawson, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 157,087, June 28, 1971, Pat. No. 3,768,787. This application Mar. 20, 1973, Ser. No. 343,106
Int. Cl. F02m *7/06, 9/06*
U.S. Cl. 261—23 A **9 Claims**



1. A multibarrel, multistage carburetor for a spark ignition internal combustion engine which comprises

a. at least one primary barrel which includes
1. a first mixing conduit having a venturi,
2. a fuel nozzle situated in said venturi to deliver fuel to said first conduit,
3. a first throttle means mounted in said conduit downstream of said fuel nozzle, said throttle means being manually moveable between opened and closed position,
4. choke means situated in said first conduit upstream of said nozzle, said choke means being mounted in said conduit to permit manual movement between closed and opened positions,
5. a vacuum modulated throttle by-pass which provides required enrichment of fuel/air mixture during engine deceleration, and

b. at least one secondary barrel, having no choke means, which includes
6. a second mixing conduit having a cross-sectional area larger than said first mixing conduit,
7. a second throttle means rotatably mounted in said second conduit to permit manual movement between closed and opened positions, said second throttle means being directly linked to said first throttle means so that said second throttle means begins to open when said first throttle means reaches a pre-determined open position,
8. slidably adjustable means situated above said second throttle means, and being positioned to move across the short axis of and into said second conduit, said slidably adjustable means having a needle axially attached to the end which enters said conduit and being attached to a vacuum operator at the opposite end, said vacuum operator being responsive to a vacuum signal obtained at a point in said second conduit just above said second throttle means,
9. a fuel orifice for providing fuel to said second conduit, situated in said second conduit upstream of said second throttle means and opposite said slidably adjustable means, the extent of said fuel orifice opening being controlled by the movement of said needle into and out of said orifice as said slidably adjustable means responds to said vacuum operator,
10. a fuel/air mixture enrichment means which comprises a vane situated in and substantially parallel to the long axis of said second conduit, said vane being responsive to manifold vacuum and acting to reduce the cross-section area of said second conduit in the region of the slidably adjustable means at high engine loads,

c. means for enriching the air/fuel mixture in at least said primary barrel during acceleration,

said primary barrel providing fuel/air mixture to said engine at idle and relatively low engine loads and combining with said second barrel to provide fuel/air mixture to said engine at higher engine load.

3,885,005
PRODUCTION OF REFRACTORY ARTICLES BY A FREEZECAST PROCESS

Howard Leroy Downing, and Ned Wright Roudabush, both of Cincinnati, Ohio, assignors to The Chas. Taylor's Sons Company, Cincinnati, Ohio

Filed Aug. 20, 1973, Ser. No. 389,465
Int. Cl. B29c *25/00*
U.S. Cl. 264—28 **1 Claim**

1. A method for preparing a precision shaped refractory body having finished dimensions, said refractory body being selected from the group consisting of metal oxide and metal silicates, which comprises selecting a refractory composition in which at least 70 percent of the particles in said composition are of size greater than 200 mesh up to one-half inch, adding to said composition a colloidal silica sol to form an aqueous slurry, said slurry containing from 85 to 95 percent solids and said sol containing from 5 to 20 percent silica,

feeding said slurry into the die cavity of a pair of precision, non-porous complimentary mold pieces, refrigerating said slurry in said die cavity to a temperature below 15°F., to form an irreversible precipitation of the colloidal silica sol between the refractory particles, thus forming a bond of great strength, then freezing the entire refractory body, removing said frozen body from said die, subjecting the frozen body to an elevated temperature to thaw the ice and to dry the water from said material before the water reacts with the surface of the refractory body, thereby preventing the water from harming the finished dimensions of the precision shaped body and firing said dried material at a temperature from 2,000° to 3,500°F. to form a refractory body having a porosity of less than 25 percent, a density above 2.0 g/cc, and a modulus of rupture above 1,200 psi, and having a substantially increased thermal shock resistance, said refractory body being precision shaped and having finished dimensions.

3,885,006

COMPOSITE FRICTION ARTICLES AND METHODS OF MAKING SAME

Donald M. Hatch; George M. Studdert, both of Huntington Beach; John B. Williamson, Corona Del Mar, and Roger W. Wycinowski, Fountain Valley, all of Calif., assignors to Hitco, Irvine, Calif.

Filed May 2, 1973, Ser. No. 356,516
Int. Cl. B29c *25/00*
U.S. Cl. 264—29 **8 Claims**

1. A method of making a composite friction article from a mixture including asbestos fibers and a carbonizable resin comprising the steps of heating the mixture to a temperature of 250°–400° F at a pressure of 500–12,000 psi to cure the mixture, thereafter heating the mixture to a temperature of 350°–500° F at a pressure of 1,000–5,000 psi to postcure the mixture, and thereafter heating the mixture to at least 700° F at a pressure of 500–1,000 psi to pyrolyze the mixture.

3,885,007

PROCESS FOR EXPANDING PYROLYTIC GRAPHITE

Larry C. Olsen, Richland, and Howard W. Scott, Kennewick, both of Wash., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Sept. 8, 1969, Ser. No. 855,838
Int. Cl. C01b *31/00*
U.S. Cl. 264—42 **10 Claims**

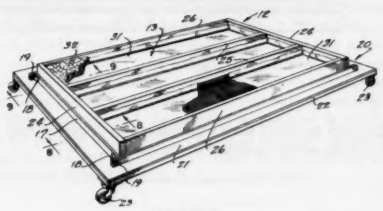
1. A process for expanding pyrolytic graphite which comprises placing said pyrolytic graphite in a chamber having dimensions in which movement in the direction parallel to the deposition surface (the a-b direction) is constrained by the chamber side walls, but which allows movement only in the direction normal to the depostion surface (the c-direction), treating said pyrolytic graphite with an intercalating agent to cause said pyrolytic graphite to expand in the direction normal to the deposition surface (the c-direction) while constraining movement in the direction parallel to the deposition surface (the a-b direction) by the side walls of said chamber and continuing said treatment for a period of about 1 to about 120 minutes sufficient to substantially completely delaminate said expanded pyrolytic graphite, and heating from about 300° to about 700°C, said delaminated expanded pyrolytic graphite while permitting movement in the direction normal to the deposition surface and constraining movement of said delaminated pyrolytic graphite in the direction parallel to the deposition surface by the side walls of said chamber, to cause said delaminated expanded pyrolytic graphite to expand further in the direction normal to the deposition surface.

3,885,008

METHOD FOR PRODUCING PREFABRICATED WALL SECTION WITH MOLDED PANELS

Robert E. Martin, Route No. 3, Box 188A, Gainesville, Tex. 76249

Continuation-in-part of Ser. No. 880,088, Nov. 26, 1969, abandoned. This application Aug. 11, 1972, Ser. No. 279,871
Int. Cl. B29d *27/00*; **E04c** *2/02*
U.S. Cl. 264—45.3 **8 Claims**



1. A method for manufacturing a prefabricated building wall section including a thin wall panel defining a simulated masonry surface and a support frame integrally attached to one surface thereof including the steps

providing a shallow mold having a substantially planar bottom wall, defining the mold surface for forming the exposed finish surface of a molded wall panel, and having side walls of uniform height to define the edges of the molded wall panel;

mixing a liquid component including, by volume, about 60% of a thermosetting resin, about 25% resin thinner, about 9% flow enhancer, and a curing agent;

mixing thoroughly about 18 to 30% by weight of said liquid components with about 70 to 82% of a solids component consisting of a comminuted, crystalline, insoluble earthen material, to produce a homogeneous panel mixture;

filling said shallow mold with said panel mixture and leveling said mixture with the mold side walls;

placing a unitary, open panel supporting frame contiguous to the surface of said panel mixture exposed by said mold, while said mixture remains in said mold, in position to be bonded to said mixture;

applying a coating of fiberglass reinforced plastic to the exposed surface of said panel mixture and to the adjacent transverse surfaces of the wall frame members, to effect a bond between said panel and frame;

effecting the cure of said panel mixture and the bonding of said frame thereto;

and removing the integral assembly of cured panel and frame from said mold.

3,885,009

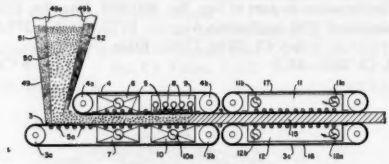
METHOD AND APPARATUS FOR PRODUCTION OF STRATIFIED SHEETS AND ARTICLES OF EXPANDED THERMOPLASTIC MATERIALS

Andre Rivat-La housse, Paris, France, assignor to Certain-teed Products Corporation, Valley Forge, Pa.

Continuation-in-part of Ser. No. 781,372, Dec. 5, 1968, abandoned. This application Jan. 14, 1969, Ser. No. 791,063
Claims priority, application France, Dec. 6, 1967, 67.131156; Jan. 15, 1968, 68.135998
Int. Cl. B29d *27/03*
U.S. Cl. 264—45.4 **7 Claims**

1. The method of forming blocks, sheets and specially shaped articles from granular thermoplastic material containing a blowing agent, comprising, depositing discrete superposed layers of granules into a mold, preheating the granules

to about their softening temperature without agglomerating them, and subsequently insufflating the preheated granules



with steam to effect their expansion and cohesion into a unitary article, while confined in the mold.

3,885,010

PROCESS AND APPARATUS FOR THE CONTINUOUS MANUFACTURE OF PHENOLIC RESIN FOAM IN ENDLESS SHEETS

Klaus Bruning; Hans Junger; Wolfgang Pungs; Peter Rheinfeld, all of Troisdorf; Franz Weissenfels, and Michael Wienand, both of Siegburg, all of Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

Filed Dec. 4, 1972, Ser. No. 311,913

Claims priority, application Germany, Dec. 2, 1971, 2159726

Int. Cl. B32b *5/18, 11/06;* **C08g** *53/10*

U.S. Cl. 264—46.2 **30 Claims**

1. In a process for the continuous manufacture of phenolic resin foam in an endless sheet by mixing a liquid phenolic resin with a blowing agent and an acid-containing curing agent and by processing of the mixture in a temperature-controllable double belt press, the improvement which comprises cooling the liquid phenolic resin to a temperature of from about 8° to about 15°C., admixing a blowing agent under a high pressure with said resin to form a resin premix, mixing said resin premix with a curing agent to form a curable reaction mixture, continuously applying said mixture uniformly onto a moving substrate, covering the mixture on said substrate with a continuous protective layer, passing the covered mixture in the double belt press, and foaming the mixture under pressure until said sheet is formed.

3,885,011

VACCINE ADJUVANTS

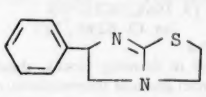
Gerard Renoux, and Micheline Renoux, both of Indre et Loire, France, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 213,554, Dec. 29, 1971, abandoned. This application Mar. 16, 1973, Ser. No. 342,118

Int. Cl. C12k *5/00*

U.S. Cl. 424—92 **9 Claims**

1. In the method of producing an immunological response in a host by the administration of a vaccine, the improvement which comprises the adjunctive administration to said host of an effective immunostimulating amount of a member selected from the group consisting of an imidazo[2,1-b]-thiazole having the formula:



and the therapeutically active acid addition salts thereof.

3,885,012

NEW PROTEASE-INHIBITING SUBSTANCE, ITS EXTRACTION, AND ITS USE

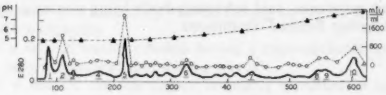
Harald Tschesche, Groebenzell; Hans Fritz, Hohenbrunn, and Rudolf Christoph, Munich, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 2, 1973, Ser. No. 337,699

Claims priority, application Germany, Mar. 3, 1972, 2210262

Int. Cl. C07c *103/52*

U.S. Cl. 424—177 **15 Claims**



1. A protease-inhibiting substance characterized by an inhibiting action toward tyrpsin chymotrypsin, plasmin and kininogenases; said substance containing at least one isoinhibitor having an isoelectric point below 10.5, a content of 55–70 amino acid residues, and a molecular weight of about 6500, wherein said protease-inhibiting substance is obtained by a process comprising:

i. homogenizing edible snails of the genus Helix of the family *Helicidae* to produce a homogenate;

ii. separating the homogenate into a precipitate and a supernatant liquid, and

iii. mixing the supernatant liquid with ammonium sulphate up to 63% of the saturation cencentration to precipitate the protease-inhibiting substance.

3,885,013

METHOD FOR PRODUCING ACRYLIC SYNTHETIC FIBERS

Mitsunori Sato, Okayama, Japan, assignor to Japan Exlan Company Limited, Osaka, Japan

Filed Mar. 19, 1973, Ser. No. 342,430

Claims priority, application Japan, Mar. 21, 1972, 47-28296

Int. Cl. D01f *7/00*

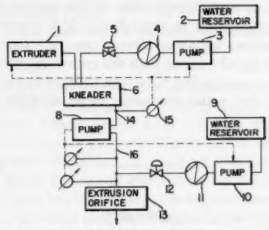
U.S. Cl. 264—182 **2 Claims**

1. A method of producing acrylic synthetic fibers which comprises extruding a spinning solution of an acrylonitrile polymer containing at least 80 percent by weight of combined acrylonitrile, dissolved in a rhodanide as solvent to produce a solvent concentration of 40–70 percent by weight, through spinnerette orifices into a coagulation bath, containing a concentration of the rhodanide which is 40–70 percent of the concentration of the rhodanide in the spinning solution, while maintaining a linear velocity ratio of the free-extrusion above 1 and a jet-stretch ratio above 1.5.

3,885,014
PRODUCTION OF FINE FIBER MASS

Tadayuki Fukada, and Isao Fujita, both of Kashima, Japan, assignors to Kabushiki Kaisha Oji Yuka Goseishi, Tokyo, Japan

Filed May 26, 1972, Ser. No. 257,419
Claims priority, application Japan, June 1, 1971, 46-38109
Int. Cl.[2] D01D 5/04
U.S. Cl. 264—205 10 Claims

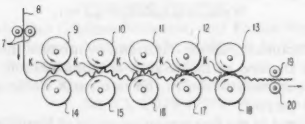


1. A process of producing a mass of fine fibers which comprises:
1. introducing water into a mass of molten linear water-insoluble polyolefin polymer under an elevated temperature and pressure in a quantity of from 2 to 50 percent by weight of the resulting mixture;
2. kneading the resulting mixture while maintaining the mixture at an elevated pressure thereby to produce a molten polymer mass which contains water finely and uniformly dispersed therein;
3. transferring the resultant molten polymer mass under an elevated temperature and pressure to an orifice with an introduction of supplementary water under an elevated temperature and pressure in a quantity of at least 100 percent by weight of said molten polymer mass produced from step (2) at a part immediately before or just at the orifice; and then
4. extruding the mixture of water and molten polymer mass obtained from the step (3) into a region of lower pressure so as to evaporate the water dispersed in the molten polymer mass and the supplementary water introduced into the step (3) whereby the molten polymer mass is cooled and subdivided into a mass of fibers.

3,885,015
METHOD OF PROCESSING A HEAT-SHRINKABLE SHEET-LIKE MATERIAL

Michikaze Ono; Toshio Ito; Shoichi Nagai, all of Nagoya, and Hironaga Mizuno, Nogakute-Mura, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jan. 11, 1973, Ser. No. 322,823
Int. Cl. B29c 25/00
U.S. Cl. 264—230 4 Claims

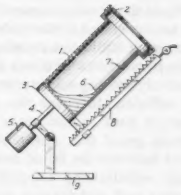


1. A method of processing a heat-shrinkable sheet-like material having a specific volume of not more than 5 cm^3/g and a maximum heat-shrinkage stress under dry heat of at least 1/10 W g/cm wherein W is the weight in grams of the sheet-like material per square meter, to produce a pattern in said material comprising passing said sheet-like material sequentially through nips between a first heating device heated to a surface temperature not lower than the minimum temperature at which the sheet-like material can shrink but below the melting point of the heat-shrinkable substance contained in said sheet-like material to produce a pattern in said material and a second heated device heated to a surface temperature which is at least the temperature of the atmosphere during processing but is below the melting or softening point of any heat-shrinkable thermoplastic substance contained in said sheet-like material and spaced from said first heating device by a distance larger than the thickness of said sheet-like material but not larger than 100 times the thickness of the sheet-like material to control the pattern produced in said sheet-like material, under a tension not exceeding the shrinkage stress of said sheet-like material while bringing the sheet-like material into contact with said first heating device without positive pressing thereto and at least bringing a portion of said sheet-like material into contact with said second device, heating the sheet-like material and developing a random solid heat-shrinkage pattern thereon, there being at least two of said first heating devices and two of said second heated devices used, said first and second devices being used in pairs.

3,885,016
PROCESS FOR MOLDING HOLLOW THERMOPLASTIC ARTICLES AND RESULTING ARTICLES

Stewart Pivar, Muttontown, N.Y., assignor to Rototron Corporation, Farmingdale, N.Y.

Continuation of Ser. No. 202,975, Nov. 29, 1971, which is a continuation-in-part of Ser. No. 84,503, Oct. 27, 1970, Pat. No. 3,703,348, which is a continuation of Ser. No. 724,802, April 29, 1968, abandoned. This application Oct. 26, 1973, Ser. No. 410,045
Int. Cl. B29d 9/08
U.S. Cl. 264—269 14 Claims

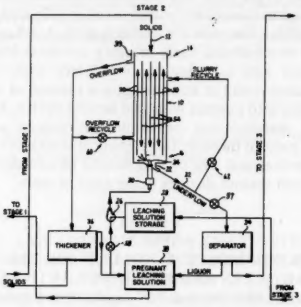


1. A process for molding a hollow article from a thermoplastic material comprising the steps of depositing a measured amount of said thermoplastic material in a hollow metal mold having side and bottom walls, rotating said mold about a horizontal axis while simultaneously heating said mold and maintaining said axis in horizontal attitude until a layer of partially fused material is formed against the side wall thereof, pivoting said mold to an attitude which is inclined with respect to the horizontal and heating the mold in the latter said attitude for an additional period of time until a layer of partially fused material is formed against the bottom wall and during which additional period of time said layer of partially fused material previously formed against the side wall is permitted to continue to further fuse by the continued application of heat, returning the mold to horizontal attitude for an additional period of time to form an additional layer of partially fused material on the previously formed layer, continuing heating of said mold until at least substantially all of the material is fused, there being dwell periods at the horizontal and inclined attitudes which are of such duration that interfacial bonds are formed which are insufficiently complete to form a homogeneous mass, cooling the mold, and removing the thusly molded article from the mold whereby a laminated article is formed entirely from said measured amount and from the said material.

3,885,017
HYDROMETALLURGICAL LEACHING

Charles W. Robinson, San Francisco, and Kenneth E. Merklin, Tiburon, both of Calif., assignors to Marcona Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 305,144, Nov. 9, 1972, abandoned. This application Nov. 1, 1973, Ser. No. 411,912
Int. Cl. C01b ; C01c ; C01d ; C01f ; C01g ; C22b
U.S. Cl. 423—1 **9 Claims**



1. A method for leaching the extractable mineral values from an ore having particulate form using a reactor vessel in which ore and a leaching liquid are simultaneously placed in contact, comprising the steps of introducing the ore into the upper region of the reactor vessel and simultaneously introducing the extracting liquid into a lowermost region of the vessel such that the solids gradually move as a solids-in-contact bed downwardly under gravity through a rising column of extracting liquid to provide counter-current extraction of the values from said ore, and further comprising the steps of directing the extracting liquid as a rotating agitating stream in a region generally parallel to and above the bottom wall of said vessel, progressively moving said stream about said lower region at a speed sufficient to cause the development of a highly agitated reaction zone in said lower region, the agitation being sufficiently great that constant intermixing and recontact is obtained between the liquid and the solids in said zone, simultaneously withdrawing a liquid overflow stream from the upper region and withdrawing solids as underflow from said lower region of said vessel and, controlling the rate of solids withdrawal so that a substantial predetermined height of solids introduced into the vessel is maintained in an overlying zone of solids-in-contact, said overlying zone gradually moves downwardly toward and then through said agitation zone at a rate controlled by said solids withdrawal rate, said overlying zone being in contact with said agitation zone.

3,885,018
REGENERATING ANION EXCHANGE ZONE CONTAINING HEXAVALENT CHROMIUM

Robert B. Smith, Crown Point, Ind., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed June 4, 1973, Ser. No. 366,544
Int. Cl. C01g *37/14*; B01d *15/06*
U.S. Cl. 423—54 **8 Claims**

1. Method both for recovering chromium from strong base anion exchange resin which has been used in the hydroxide form to remove hexavalent chromium in the form of anions from a solution and for regenerating the resin for reuse for removing hexavalent chromium in the form of anions from a solution; comprising the steps of

a. introducing water into a column containing the resin thereby backwashing the resin to remove extraneous solids and resin fines,

b. removing residual backwash water,

c. passing aqueous alkali metal hydroxide into the column containing the resin and providing effluent from the column containing from about 90 to about 95% of the hexavalent chromium present in the column while leaving in the column alkali metal cations and the remainder of the hexavalent chromium in the form of anions to thereby optimize the concentration of hexavalent chromium in the effluent,

d. introducing water into the column and recirculating resulting liquid between that column and a column containing cation exchange resin of the strong acid type in the hydrogen form to react hexavalent chromium in the form of anions with the anion exchange resin and to react the alkali metal cations with the cation exchange resin, to establish a continuing 5 to 10% level of hexavalent chromium in the anion exchange resin thereby conserving chromium.

3,885,019
CATALYTIC REDUCING DECOMPOSITION OF OXIDES OF NITROGEN

Kunichi Matsushita, Kawasaki; Hikaru Sakurada, Yokohama, and Kazuhiko Onuma, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Japan

Filed Dec. 26, 1973, Ser. No. 428,222
Claims priority, application Japan, Dec. 25, 1972, 48-784
Int. Cl. B01d *53/00*
U.S. Cl. 423—213.2 **11 Claims**

1. In a process for the catalytic reduction of oxides of nitrogen present in exhaust gas, the improvement which comprises: contacting said exhaust gas with a catalyst of cerium oxide or uranium oxide in the presence of ammonia.

3,885,020
METHOD OF OXIDIZING HYDROCARBONS AND OXYGENATED HYDROCARBONS TO CARBON DIOXIDE AND WATER

James M. Whelan, La Canada, Calif., assignor to University of Southern California, Los Angeles, Calif.

Filed Oct. 28, 1971, Ser. No. 194,769
Int. Cl. C01b *53/34*; B01d *53/34*
U.S. Cl. 423—245 **1 Claim**

1. A process for the oxidation of hydrocarbons and oxygenated hydrocarbons to carbon dioxide and water with oxygen which comprises: combining the hydrocarbons and oxygenated hydrocarbons with a predetermined amount of oxygen containing gas to give at least a 1% stoichiometric excess of oxygen for the oxidation of the hydrocarbons and oxygenated hydrocarbons to carbon dioxide and water; and passing the resulting mixture over a ceramic homogenous mixed oxide catalyst compound at a temperature between about 100°C. and about 1,000°C., said catalyst compound having the following empirical formula:

$$W_kX_nJ_{(1-k-n)}ZO_{(3 \quad m)}, \text{ m),}$$

wherein

W is Zirconium, Tin or Thorium, or mixture thereof;

X is an alkaline earth metal or mixture thereof;

J is scandium, yttrium, or the rare earth elements, or mixtures thereof;

Z is a metal of the first transition series or a mixture thereof, at least 0.01% of said metal having an oxidation state other than +3;

k is a number having a value between 0 and about 0.1;

m is a number having a value of from 0 to about 0.26; and *n* is a number having a value from 0 to about 0.51, provided when *n* has a value of 0, *k* has a value between 0 and about 0.05.

3,885,021

Patent Not Issued For This Number

3,885,022

METHOD OF PRODUCING BORON CARBIDE FROM WATER-ALCOHOL SOLUTION OF CARBON SOURCE

Geoffrey Lyall Harris, Monroeton, and Donald S. Parsons, Towanda, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 10, 1974, Ser. No. 432,345

Int. Cl. C01b *31/30*

U.S. Cl. 423—291 **10 Claims**

1. In a process wherein a boron source selected from the group consisting of boric acid and boron oxide, a hydrocarbon carbon source which under heat will decompose to form elemental carbon and water and a polyhydric alcohol selected from the group consisting of glycerol, ethylene glycol and diethylene glycol are mixed together to form a solution which is heated to form boron carbide, the improvement comprising

a. adding a controlled amount of water to said solution of said boron source, said hydrocarbon carbon source and polyhydric alcohol,

b. drying said solution in air at a temperature relatively close to the boiling point of the alcohol,

c. heating the dried material in a hydrogen atmosphere at a temperature of from about 690° C to about 710° C to form a granular product, and

d. firing said granular product at a temperature of at least about 1700° C in an inert gas atmosphere to form a free flowing boron carbide powder.

3,885,023

PREPARATION OF IRON CARBIDE (Fe_3C)

Peter R. Gray, and Billy J. Leroy, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 15, 1973, Ser. No. 332,567

Int. Cl. C01b *33/12*

U.S. Cl. 423—439 **4 Claims**

1. A process for preparing high yields of essentially pure iron carbide, which comprises treating in a batch a feed material consisting essentially of ferric oxide at atmospheric pressure with a gas consisting essentially of carbon monoxide at a temperature within the range of 500°-550°C for a period of time sufficient to allow essentially complete conversion to occur and produce a product containing at least about 98 weight percent iron carbide (Fe_3C).

3,885,024

PROCESS FOR THE PREPARATION OF PYROSULPHATES

Paolo Koch, San Giuliano Milanese, and Emilio Perrotti, San Donato Milanese, both of Italy, assignors to Snamprogetti S.p.A., San Donato Milanese, Italy

Filed May 21, 1973, Ser. No. 362,052

Int. Cl. C01b *17/98*

U.S. Cl. 423—512 **4 Claims**

1. A process for the preparation of ammonium and alkali metal pyrosulphates characterized in that ammonium or alkali metal hydroxide is reacted with sulphurous anhydride and oxygen in an alcohol containing 3 or more carbon atoms, at temperatures lower than 60°C by employing, as catalyst, a copper compound selected from cuprous or cupric salts of the anions Cl^-, Br^-, I^-, ClO_4^-, $SO_4^=$, and CH_3COO^-.

3,885,025

PREPARATION OF BERYLLIUM HYDRIDE

Byron R. Lowrance, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.

Filed Feb. 26, 1962, Ser. No. 176,865

Int. Cl. C01b *6/04*

U.S. Cl. 423—645 **11 Claims**

1. A process for the preparation of beryllium hydride which comprises pyrolyzing, while in solution in a solvent inert, under the reaction conditions, with respect to reactants and products and at a temperature in the range of about 100° to about 200°C, sufficient to result in the formation of beryllium hydride, a di-t-alkyl beryllium etherate wherein each tertiary alkyl radical contains from 4 to 20 carbon atoms, the pyrolysis being carried out under an atmosphere inert, under the reaction conditions, with respect to reactants and products.

3,885,026

PREPARATION OF POROUS TABLETS

Helmut Heinemann, Heidelberg, and Werner Rothe, Hockenheim, both of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Filed Sept. 10, 1973, Ser. No. 395,796

Claims priority, application Germany, Sept. 20, 1972, 2246013

Int. Cl. A61j *3/10*; **A61k** *9/02*; **B29d** *27/00*

U.S. Cl. 424—14 **13 Claims**

1. In the production of pharmaceutical or reagent tablets which are to undergo disintegration in use wherein the tablet components are mixed and pressed into predetermined shape, the improvement which comprises incorporating into the mix at least one inert solid adjuvant, sublimable at a temperature up to about 110°C pressing the mix into tablets, and thereafter subjecting the tablets to at least one of vacuum and heating to a temperature up to about 110°C so as to sublime the adjuvant, whereby the resulting tablets are porous, strong, shape retaining and readily disintegratable.

3,885,027

ORALLY ADMINISTERED DRUG COMPOSITION FOR THERAPY IN THE TREATMENT OF NARCOTIC DRUG ADDICTION

Irving F. Shaw, East Rockaway, and Jerome Berk, New Rochelle, both of N.Y., assignors to West Laboratories, Inc., Long Island City, N.Y.

Continuation-in-part of Ser. No. 133,344, April 12, 1971, abandoned. This application Aug. 13, 1973, Ser. No. 387,712

Int. Cl. A61k *9/00*, *27/00*

U.S. Cl. 424—44 **13 Claims**

1. A solid composition for the oral treatment of narcotic addiction which is dispersible for dissolution in an acidic medium before ingestion, said composition comprising:

a. an effective amount of amine-containing therapeutic agent for the maintenance therapy treatment of narcotic drug addiction, the hydrochloride salt form of which is soluble in water but essentially insoluble in alkaline solution,

b. a precipitating agent selected from the class consisting of:

1. an ingestible solid alkalinizing agent in an amount which provides an alkaline pH of at least 7.5 when dissolved in water either directly, or indirectly upon heating or concentration of the solution,

2. an ingestible alkaloid precipitating substance selected from the group consisting of tannic acid and picrolonic

acid in an amount active as a precipitant in non-acidic conditions, and

3. combinations of (1) and (2).

3,885,028

FLUORIDE-CONTAINING TOOTHPASTE

John A. Cella, Lake Forest, Ill., and William H. Schmitt, Branford, Conn., assignors to Alberto-Culver Company, Melrose Park, Ill.

Continuation-in-part of Ser. No. 31,789, April 24, 1970, Pat. No. 3,703,578. This application Sept. 22, 1972, Ser. No. 291,315

Int. Cl. A61k *7/16*

U.S. Cl. 424—52 **21 Claims**

1. A non-foamable toothpaste containing (a) a major proportion of a toothpaste abrasive based on the weight of the solids of said toothpaste, said abrasive consisting essentially of at least one member selected from the group consisting of precipitated calcium carbonate, dicalcium phosphate dihydrate, dicalcium phosphate anhydrous, dibasic calcium phosphate, tribasic calcium phosphate, calcium pyrophosphate, calcium sulfate, hydrated alumina and insoluble sodium metaphosphate, (b) from about 0.01% to about **0.4%, 0.4%,** by weight of the toothpaste, of a fluorine-containing compound which is ionizable in water to yield fluoride ions, (c) at least one paste-forming ingredient, (d) at least 20%, by weight of the total of the liquid ingredients of said toothpaste, of at least one water-soluble polyoxyalkyleneglycol having an average molecular weight of at least 200, the alkylene radicals of said polyoxyalkyleneglycol containing from 2 to 4 carbon atoms, said polyoxyalkyleneglycol constituting at least about 15% by weight of the toothpaste, said toothpaste being essentially free of mineral oil, vegetable and animal triglyceride oils.

3,885,029

DENTIFRICE PREPARATION

James Norfleet, Plainfield, and Donald W. Clipper, Edison, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 9, 1973, Ser. No. 349,314

Int. Cl. A61k *7/16*

U.S. Cl. 424—57 **4 Claims**

1. A dentifrice preparation comprising about 30 to 50 percent by weight of said dentifrice of individual particles of polyvinyl chloride and a cleaning and polishing material which consists of up to about 15 percent by weight of said dentifrice of individual particles of cleaning and polishing material wherein anhydrous dicalcium phosphate having particles of sizes ranging up to about 50 microns is present in an amount of effective to clean and polish dental enamel up to about 10 percent by weight of said dentifrice and at least two-thirds by weight of said cleaning and polishing material is anhydrous dicalcium phosphate.

3,885,030

MEDICINE COMPRISING LYSINE BY-PRODUCTS

Georges Tixier, 37 Ave. d'Iena, Paris, 16, France

Filed May 9, 1973, Ser. No. 358,694

Claims priority, application France, May 19, 1972, 7218165

Int. Cl.[2] A01N *9/00*

U.S. Cl. 424—180 **8 Claims**

1. A pharmaceutical composition in dosage form for reestablishing normal leukocyte formula figures in leukopenic patients comprising:

an amount sufficient to reestablish normal leukocyte figures in leukopenic patients of a mixture of on the order of about 60 parts by weight of lysine pantothenate with on the order of about 30 parts by weight of a nucleotid selected from the group consisting of lysine desoxyribonuclinate and lysine ribonucleinate, and on the order of about 30 to 40 parts by weight of the puric and pyrimidic bases of the bone medulla and of the spleen; and

a pharmaceutically acceptable carrier therefor.

3,885,031

INSECTICIDAL COMPOSITIONS AND METHODS OF COMBATTING INSECTS USING CYCLOPROPANE CARBOXYLATE INSECTICIDES WITH A SYNERGISTIC COMPOUND OF MONO (ALKYL AND ALKENYL) MONO OMEGA-ALKYNYL ARYLPHOSPHONATES

Ronald Eugene Montgomery, Middleport, and Harry Hobart Incho, Medina, both of N.Y., assignors to FMC Corporation, New York, N.Y.

Division of Ser. No. 122,168, March 8, 1971, Pat. No. 3,709,988, which is a division of Ser. No. 800,264, Feb. 18, 1969, Pat. No. 3,652,741, which is a continuation-in-part of Ser. No. 630,204, April 12, 1967, abandoned, which is a continuation-in-part of Ser. No. 559,422, June 22, 1966, abandoned, and Ser. No. 624,689, March 21, 1967, abandoned. This application Oct. 2, 1972, Ser. No. 294,238

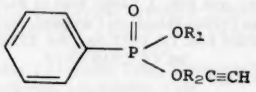
Int. Cl. A01n *9/08, 4/36*

U.S. Cl. 424—192 **11 Claims**

1. An insecticidal and acaricidal composition comprising and insecticidally and dicaricidally effective amount of a combination of

A. an insecticidal cyclopropanecarboxylate the insecticidal activity of which is synergized by

B. a synergistically effective amount of a compound of the formula



wherein R_1 is selected from the group consisting of alkyl and alkenyl having one to six carbon atoms; and R_2 is alkylene of one to four carbon atoms; wherein the ratio of A:B is in the range of 1:2 to 1:50.

3,885,032

INSECTICIDAL N-ARALKANOYL AND N-ARALKENOYL DERIVATIVES OF O,S-DIHYDROCARBYLPHOSPHOROAMIDOTHIOATES AND S,S-DIHYDROCARBYLPHOSPHOROAMIDODITHIOATES

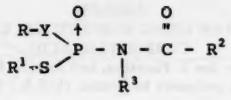
Philip S. Magee, Ignatio, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 317,476, Dec. 21, 1972, Pat. No. 3,825,634, which is a continuation-in-part of Ser. No. 13,846, Feb. 24, 1970, Pat. No. 3,716,600, which is a continuation-in-part of Ser. No. 810,383, March 25, 1969, abandoned. This application June 14, 1974, Ser. No. 479,344

Int. Cl. A01n *9/36*

U.S. Cl. 424—212 **12 Claims**

1. A method of killing insects which comprises contacting said insects or their habitats with an insecticidally toxic amount of the compound of the formula



wherein R and R^1 individually are alkyl, alkenyl or alkynyl of up to 6 carbon atoms, R^2 is phenylalkyl or phenylalkenyl of 7 to 10 carbon atoms substituted with up to 2 fluorine, chlorine or bromine atoms, R^3 is hydrogen or alkyl of 1 to 6 carbon atoms and Y is oxygen or sulfur.

3,885,033

METHOD OF ANESTHETIZING A MAMMAL BY ADMINISTRATION OF A SUBSTITUTED 2-ARYLALKYLOXY BENZAMIDE

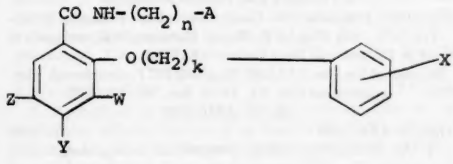
Michel Leon Thominet, Paris, France, assignor to Societe d'Etudes Scientifiques et Industrielles de L d'Ile-de-France, Paris, France

Division of Ser. No. 324,509, Jan. 17, 1973, Pat. No. 3,833,733, which is a division of Ser. No. 108,963, Jan. 22, 1971, Pat. No. 3,723,416, which is a continuation-in-part of Ser. No. 714,795, March 21, 1968, Pat. No. 3,594,417. This application Dec. 13, 1973, Ser. No. 424,218

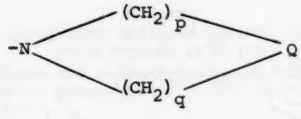
Int. Cl. A61k *27/00*

U.S. Cl. 424—246 **9 Claims**

1. The method of anesthetizing a mammal which comprises administering to said mammal an anesthetically effective amount of a compound selected from the class consisting of 2-arylalkyloxy benzamides and their pharmaceutically acceptable acid addition and quaternary ammonium salts, said substituted 2-arylalkyloxy benzamides having the formula:



in which A is a monovalent radical having the formula:



in which *p* and *q* are 1 or 2, at least one of *p* and *q* being 2; Q is methylene, sulfur, oxygen, nitrogen or monoalkylamino in which the alkyl group has from one to five carbon atoms; W, Y and Z are hydrogen, halogen, amino or alkylamino in which the alkyl group has from one to five carbon atoms; X is hydrogen or halogen and *k* is 1 or 2; *n* is 1, 2 or 3, at least one of W, Y and Z being other than hydrogen.

3,885,034

PHENOTHIAZINE DERIVATIVES IN THE TREATMENT OF PSYCHOTIC PERSONS

Klaus Heinz Risse; Ulrich Hörlein, and Wolfgang Wirth, all of Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

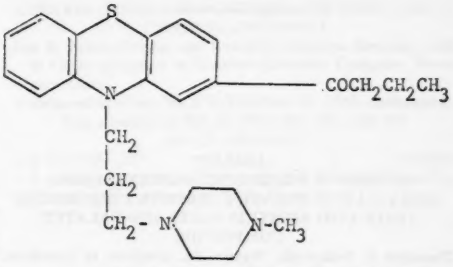
Continuation of Ser. No. 350,684, March 10, 1964, abandoned, which is a continuation-in-part of Ser. Nos. 608,170, Sept. 8, 1956, abandoned, and Ser. No. 669,458, July 2, 1957, abandoned, and Ser. No. 26,707, May 4, 1960, abandoned. This application Apr. 24, 1972, Ser. No. 246,953

Claims priority, application Germany, Sept. 7, 1955, 18365; May 5, 1956, 20224; June 12, 1956, 20503; June 12, 1956, 20504; July 12, 1956, 20682

Int. Cl. A61k *27/00*

U.S. Cl. 424—247 **7 Claims**

1. The method of treating a psychotic person who exhibits regression predominantly characterized by symptoms of withdrawal and apathy when said person is in a withdrawn or catatonic state to arouse or awaken said person which comprises administering to said person a therapeutic composition containing a compound of the class consisting of a free base and salts thereof with pharmaceutically acceptable acids, said free base having the formula



combined with a carrier therefor.

3,885,035

METHOD FOR TREATING ARRHYTHMIA BY USING 1,4-BIS(4 QUINAZOLINYL) PIPERAZINES

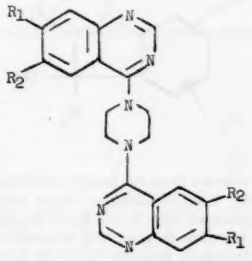
William R. Simpson, Mendham, N.J., assignor to Sandoz-Wander, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 241,408, April 5, 1972, abandoned. This application Feb. 20, 1973, Ser. No. 333,556

Int. Cl. A61k *27/00*

U.S. Cl. 424—251 **6 Claims**

1. A method for treating arrhythmia, which comprises administering to a mammal in need of said treatment an antiarrhythmic effective amount of a compound of the formula:



where R_1 and R_2 each independently represent hydrogen or lower alkoxy or a pharmaceutically acceptable acid addition salt thereof.

3,885,036
ANTIMICROBIAL THIENYLIODONIUM SALT METHODS AND COMPOSITIONS

Clarence L. Moyle, Clare, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 265,395, June 22, 1972, Pat. No. 3,763,187, which is a continuation-in-part of Ser. No. 154,182, June 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 806,739, March 12, 1969, abandoned, which is a continuation-in-part of Ser. No. 677,772, Oct. 24, 1967, abandoned. This application Jan. 15, 1973, Ser. No. 323,977

Int. Cl.[2] A01N *9/12*

U.S. Cl. 424—275 **2 Claims**

1. The method for controlling microbes selected from the group consisting of bacteria, fungi and yeasts which comprises contacting the said microbes with an antimicrobial amount of 4-chlorophenyl-2-thienyliodonium chloride, trifluoroacetate or trichloroacetate salt.

3,885,037
METHOD OF PRODUCING ANOREXIA USING IMIDAZOLINYL PHENYL CARBONYL COMPOUNDS, THEIR ACID ADDITION SALTS AND RELATED COMPOUNDS

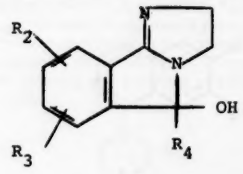
Theodore S. Sulkowski, Wayne, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 757,792, Sept. 5, 1968, Pat. No. 3,768,178, which is a continuation-in-part of Ser. No. 622,918, March 14, 1967, abandoned, and a continuation-in-part of Ser. No. 622,931, March 14, 1967, abandoned, and a continuation-in-part of Ser. No. 576,833, Sept. 2, 1966, abandoned, and a continuation-in-part of Ser. No. 487,587, Sept. 15, 1965, abandoned. This application Sept. 6, 1973, Ser. No. 394,952

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 **2 Claims**

1. A method of producing anorexia in an animal in need thereof which comprises administering to said animal an effective amount of a compound having the formula



wherein R_2 is selected from the group consisting of hydrogen, halogen, amino, lower alkylamino, lower alkyl, and lower alkoxy; R_3 is hydrogen when R_2 and R_3 are dissimilar and when R_2 and R_3 are the same they are both selected from the group consisting of hydrogen, halogen, lower alkyl, and lower alkoxy; and R_4 is selected from the group consisting of phenyl, monohalophenyl, dihalogphenyl, mono(lower)alkylphenyl, di(lower)alkylphenyl, trifluoromethylphenyl, mono(lower)alkoxy phenyl, and di(lower)alkoxyphenyl.

3,885,038
METHOD OF USING SUBSTITUTED XANTHONE CARBOXYLIC ACID

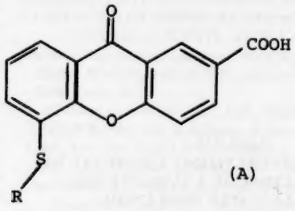
Jurg R. Pfister; Ian T. Harrison, and John H. Fried, all of Palo Alto, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 174,259, Aug. 23, 1971, Pat. No. 3,803,174. This application Dec. 18, 1973, Ser. No. 425,885

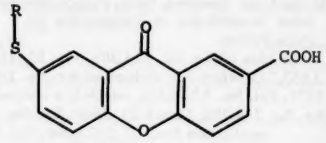
Int. Cl. A61k *27/00*

U.S. Cl. 424—283 **14 Claims**

1. A method for inhibiting the symptoms of the asthmatic condition resulting from an antigen-antibody reaction in a host susceptible to said reaction which comprises administering to said host an effective amount of from about 0.005 to about 100mg. per kg. of body weight per day sufficient to produce said inhibition of a compound selected from those represented by the formulas:



(A)



(B)

wherein R is hydrogen or lower alkyl; or a pharmaceutically acceptable lower alkyl ester, unsubstituted, monolower alkyl, or dilower alkyl substituted amide or salt thereof wherein said lower alkyl group contains one to five carbon atoms.

3,885,039
ANTIFOULING COMPOSITIONS

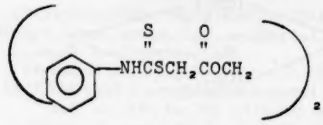
Norman J. Pinkowski, St. Louis, Mo.; Aaron Freiman, Brooklyn, N.Y., and Charles B. Beiter, Carteret, N.J., assignors to M & I Chemicals Inc., Greenwich, Conn.

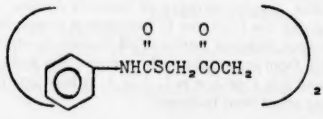
Division of Ser. No. 173,680, Aug. 20, 1971, abandoned. This application Feb. 11, 1974, Ser. No. 441,379

Int. Cl. A01n *9/00*

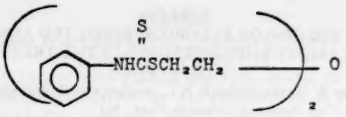
U.S. Cl. 424—288 **1 Claim**

1. An antifouling coating composition comprising a paint containing 10—30%, based on the total paint formulation, of a toxicant containing between 50 and 97% by weight of tri-n-butyltin fluoride, the remainder of said toxicant consisting of a compound selected from the group consisting of





and



3,885,040

METHODS AND BENZAMIDE COMPOSITIONS FOR PRODUCING HYPOTENSIVE ACTIVITY

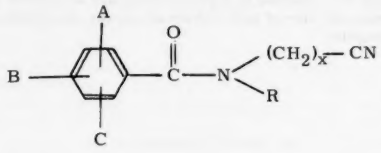
William D. Roll, Toledo, Ohio, assignor to The University of Toledo, Toledo, Ohio

Division of Ser. No. 336,415, Feb. 28, 1973, Pat. No. 3,808,315, which is a continuation-in-part of Ser. No. 180,206, Sept. 13, 1971, abandoned, which is a division of Ser. No. 822,029, May 5, 1969, Pat. No. 3,660,461. This application Apr. 25, 1974, Ser. No. 463,959

Int. Cl. A61k 27/00

U.S. Cl. 424—304 12 Claims

1. A method of producing hypotensive activity in an animal needing such treatment comprising administering internally to said host animal a nontoxic but effective quantity of a compound of the formula:



wherein A, B and C are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, and halogen, at least one of which is alkoxy or halogen, wherein x is a whole number from one to three, and wherein R is cyclo-alkyl containing between three and seven carbon atoms.

3,885,041

ANTIINFLAMMATORY USE OF PROSTAGLANDINS

Richard L. Aspinall, Glenview, and Peter S. Cammarata, Skokie, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 102,076, Dec. 28, 1970, abandoned. This application July 31, 1972, Ser. No. 276,580

Int. Cl. A61k 27/00

U.S. Cl. 424—318 3 Claims

1. A method of inhibiting chronic inflammation or the unpleasant effects thereof in a mammal which comprises administering an antiinflammatory amount of PGB_2 or PGF_2 to said mammal.

3,885,042

BENZYLIDENESEMICARBAZIDE COMPOUNDS HAVING INSECTICIDAL ACTIVITY

Rudolf Mulder, and Martin Jacob Handelé, both of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

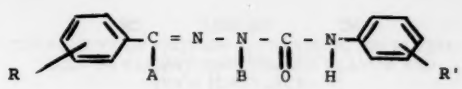
Filed Feb. 6, 1973, Ser. No. 330,004

Claims priority, application Netherlands, Feb. 9, 1972, 7201673

Int. Cl. A01n 9/12, 9/20

U.S. Cl. 424—323 10 Claims

1. A method of combatting insects and larvae of insects comprising treating said insects and larvae with an insecticidally effective amount of a semicarbazide of the formula



wherein R is a moiety selected from the group consisting of 3,4-dichloro and para-positioned substituents selected from the group consisting of hydrogen, chlorine, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbons, and amino substituted with 1 to 2 alkyls of 1 to 4 carbons each,

A is a member selected from the group consisting of hydrogen, cyclopropyl, alkyl of 1 to 4 carbons, phenyl substituted alkyl of 1 to 4 carbons and halogen substituted alkyl of 1 to 4 carbons,

B is a moiety selected from the group consisting of hydrogen and methyl, and

R′ is a moiety selected from the group consisting of 3,4 dichloro and para-positioned substituents selected from the group consisting of chlorine, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, and amino containing 1 to 2 alkyls of 1 to 4 carbons each.

3,885,043

CERTAIN OXIME COMPOSITIONS AND THEIR USE IN CONTROLLING FUNGI

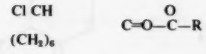
Don R. Baker, Orinda, and Arnold D. Gutman, Berkeley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 875,576, Nov. 10, 1969, abandoned. This application Feb. 8, 1973, Ser. No. 330,764

Int. Cl. A01n 9/20

U.S. Cl. 424—327 4 Claims

1. A fungicidal composition comprising a fungicidally effective amount of a compound of the formula



wherein R is alkyl of 1 through 10 carbon atoms or substituted alkyl of 1 through 10 carbon atoms in which the substituents are selected from the group consisting of chlorine and bromine and an inert carrier.

3,885,044

CHLOROTHIANTHRENES

Gunther Beck, Leverkusen, and Hans Holtschmidt, Leverkusen-Steinbuechel, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

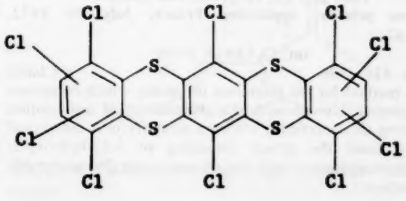
Filed May 30, 1973, Ser. No. 365,351

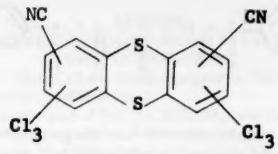
Claims priority, application Germany, June 15, 1972, 2229162

Int. Cl. C07d 73/02

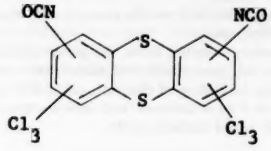
U.S. Cl. 260—327 P 2 Claims

1. Chlorothianthrene selected from the group of

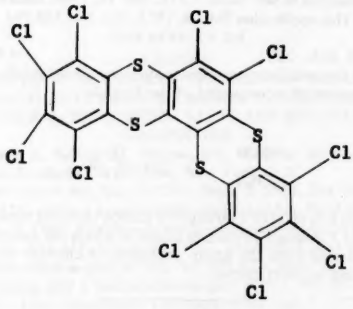




,



, and



3,885,045

THERAPEUTIC COMPOSITION CONTAINING 1-(2-HYDROXY-2-INDANYL)-PROPYLAMINE

Jacques Georges Maillard, Paris, France, assignor to Laboratoires Jacques Logeais, Issy-les-Moulineaux, France

Filed July 19, 1973, Ser. No. 380,542

Claims priority, application France, July 20, 1972, 72.26162

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—330 **6 Claims**

1. A method for the treatment of obesity which comprises administering to an obese host a pharmaceutical composition containing an anoretically effective quantity of a compound selected from the group consisting of 1-(2-hydroxy-2-indanyl)-propylamine and the pharmaceutically acceptable salts thereof.

3,885,046

META CHLORO OR FLUORO SUBSTITUTED ALPHA-T-BUTYLAMINOPROPIOPHENONES IN THE TREATMENT OF DEPRESSION

Nariman B. Mehta, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

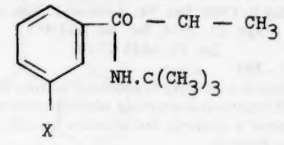
Division of Ser. No. 93,852, Nov. 30, 1970, Pat. No. 3,819,706. This application Aug. 23, 1973, Ser. No. 390,845

Claims priority, application United Kingdom, Dec. 4, 1969, 59231/69

Int. Cl. A61k *27/00*

U.S. Cl. 424—330 **14 Claims**

1. A pharmaceutical composition suitable for use in the treatment of the depressed state comprising an antidepressant-effective amount of a compound of the general formula



wherein X is chlorine or a pharmaceutically acceptable acid addition salt thereof and a pharmaceutically acceptable carrier therefor.

3,885,047

OCULAR HYPOTENSIVE PROCESS EMPLOYING DEXTROROTATORY PHENETHANOLAMINES

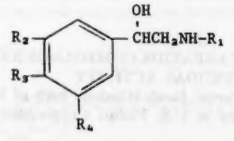
Richard J. Seidehamel, and Kendrick W. Dungan, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Continuation-in-part of Ser. No. 263,496, June 16, 1972, abandoned. This application Dec. 21, 1973, Ser. No. 427,274

Int. Cl. A61k *27/00*

U.S. Cl. 424—330 **18 Claims**

1. The process of lowering intraocular pressure in the mammalian eye which comprises topical application thereto of an effective ophthalmologically acceptable amount for lowering intraocular pressure of the dextrorotatory stereoisomer substantially free of the levorotatory stereoisomer of a compound selected from the group consisting of phenethanolamines having Formula I



Formula I

wherein

R_1 is isopropyl or tert.-butyl;

R_2 is hydroxy, hydroxymethyl, or uredio; and one of

R_3 and R_4 is hydrogen and the other is hydroxy;

and an ophthalmologically acceptable acid addition salt thereof said amount being substantially free of adrenergically mediated side effects.

3,885,048

METHOD FOR PREPARING SIMULATED MEAT, FISH AND DAIRY PRODUCTS

James J. Liggett, 1203 Fairlane Ave., Libertyville, Ill. 60048

Continuation-in-part of Ser. No. 113,637, Feb. 8, 1971, abandoned. This application Sept. 7, 1972, Ser. No. 286,976

Int. Cl. A23l *1/20*

U.S. Cl. 426—18 10 Claims

1. A process for making a food product, comprising the steps of

cooking a mixture of about 50 percent split soybeans, 25 percent bulgar wheat and 25 percent sesame in the presence of water until the vegetable pieces become saturated with water,

inoculating the cooked mixture with an aqueous culture of the group consisting of *Rhizopus Oligosporous*, aspergillus, mucor, actinomucor, monascess, saccharomyces, neurospora, acetobacter, bacillus or lactobacillus, and

incubating the inoculated mixture at a temperature exceeding 30°C in an atmosphere sufficiently humid to support mold growth until the spaces between the particles in the mixture are filled with the fibrous mycelia of the mold and the particles are thoroughly knitted together by said mycelia.

3,885,049

PREPARATION OF ACTIVE DRY YEAST

Robert Taylor, Alloa, Scotland, assignor to The Distillers Company (Yeast) Limited, England

Filed Mar. 16, 1973, Ser. No. 342,294

Claims priority, application United Kingdom, Sept. 5, 1972, 41144/72

Int. Cl. C12c *11/32*

U.S. Cl. 426—18 4 Claims

1. A process in which active dried yeast is made by feeding crumbly yeast having a dry matter content of 27 to 40 percent and a particle size of 1 mm to 2 cm continuously into a mill, said mill having a substantially cylindrical milling chamber, an inlet substantially on the axis of the chamber and an outlet leading from the cylindrical wall of the chamber, and a rotor mounted on a shaft coaxial with the milling chamber for high speed rotation, the blades on the rotor being so pitched that upon rotation of the rotor air is drawn in through the inlet and expelled through the outlet, said mill being operated at a speed of at least 1000 rpm, continuously feeding air through said mill, disintegrating the yeast in the mill, without any substantial breakdown of the yeast cells themselves, at least predominantly by air turbulence in the mill, to form a disintegrated yeast powder wherein substantially none of the particles thereof are greater than 1.7 mm in diameter and wherein the volume of the disintegrated yeast is at least twice the volume of a compressed cake of the same yeast of the same dry matter content, continuously carrying the disintegrated yeast powder out of the mill in a stream of air, separating it from the airstream and then drying it to a dry matter content of at least 92 percent, the drying being conducted by passing warm air at a temperature of less than 100°C up through a bed of the powder for a period of 10 minutes to 4 hours in such a manner as to form a fluidized or spouted bed system.

3,885,050

TREATMENT OF PROTEIN - CONTAINING MICROBIAL CELLS TO REMOVE UNDESIRABLE FLAVOR AND ODOR SUBSTANCES

John A. Ridgway, Jr., La Porte, Ind., and Kwei C. Chao, Naperville, Ill., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 285,848, Sept. 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 64,866, July 24, 1970, abandoned. This application Feb. 13, 1974, Ser. No. 442,247

Int. Cl. C12c *11/18, 11/30;* A23j *1/18*

U.S. Cl. 426—60 24 Claims

1. A process for improving the flavor characteristics of heat-killed single-cell microbial organisms, comprising the steps of:

a. heat-killing the single-cell microbial organisms by pasteurization;

b. drying said heat-killed single-cell microbial organisms to a moisture content no greater than about 8 wt. percent;

c. preparing a slurry of the dried single-cell microbial organisms with an aqueous alcoholic solution containing 60 to 80 vol. percent of an aliphatic alcohol having 1 to 3 carbon atoms per molecule in an amount to provide a weight ratio of alcoholic solution to single-cell microbial organisms within the range from 3:1 to 7:1;

d. agitating the slurry at a temperature in the range from 20° to 100°C. for a period of 0.1 to 2.0 hours;

e. filtering the slurry to recover an extracted single-cell microbial organisms; and

f. drying the extracted single-cell microbial organisms to yield a substantially solvent-free product.

3,885,051

FLAVORING AND AROMATISING WITH 3-ACETYL-2,5-IALKYL FURANS OR THIOPHENES

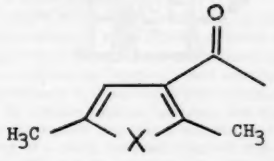
Cynthia J. Mussinan, Brick Town; Manfred Vock, West Orange, both of N.J.; Edward Joseph Shuster, Brooklyn, and Alton Dewitt Quinn, Calicoon, both of N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Oct. 30, 1972, Ser. No. 301,865

Int. Cl. A23l *1/26*

U.S. Cl. 426—535 3 Claims

1. A process for altering the hazelnut or walnut flavor of a foodstuff comprising the step of adding to a foodstuff a flavoring composition comprising from about 5×10^{-8} to about 90 percent by weight based on the total weight of the flavoring composition, of a compound having the formula:



wherein X is selected from the group consisting of sulfur and oxygen.

3,885,052

PROCESS OF PRODUCING A SOY PRODUCT HAVING IMPROVED SORPTION

Robert P. Starr, Spanish Lake, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Continuation of Ser. No. 144,324, May 17, 1970, abandoned, which is a continuation-in-part of Ser. No. 643,342, June 5, 1967, abandoned. This application Nov. 9, 1973, Ser. No. 414,553

Int. Cl. A23j *1/14*; A23l *1/31*

U.S. Cl. 426—250 9 Claims

1. A method of preparing an improved food product which exhibits a shortened time of preparation, increased retention of fat and aqueous juices on cooking, and which does not crumble and lose shape on cooking, comprising mixing a meat portion containing fat and as an emulsifier a dehulled, defatted, desolventized soy meal protein product containing less than about 40 percent of the aqueous-alkaline soluble substances originally present in the soy meal and further containing between about 20 to 45 percent by weight of protein on a dry basis which has been dried at a temperature such that the temperature of the emulsifier is about 140°F.–250°F. for a period of approximately 180–60 minutes, the meat portion containing at least about 20% by weight fat based on the weight of the meat portion, binding the mixed portions together with 5–30 percent by weight of the non-meat portion of the mixture with a binder selected from the group consisting of albumen and isolated soy protein, and forming the mixed bound portions into a shape which does not crumble and break apart under normal handling and preparation, cooking the formed mixture and retaining the fat and aqueous juices with the protein emulsifier in the mixture.

3,885,053

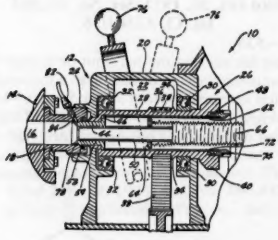
METHOD OF FORMING A SKIN SURFACE ON AN EXTRUDED MEAT EMULSION

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Continuation-in-part of Ser. No. 222,088, Jan. 31, 1972, abandoned. This application Aug. 17, 1973, Ser. No. 389,388

Int. Cl. A22c *18/00*

U.S. Cl. 426—276 3 Claims



1. A method of forming a skin surface on an extruded edible protein emulsion selected from a group consisting of meat, vegtable, fish and poultry, comprising the steps of: introducing the emulsion into a tube having a substantially continuous interior wall, extruding the emulsion from said tube by subjecting said emulsion to pressure to move said emulsion through said tube, introducing a film of an edible acid solution into said tube in intimate contact with said interior wall and the outer surface of said emulsion whereby said edible acid solution will serve as a lubricant between said emulsion and said interior wall and whereby said edible acid solution reacts with said emulsion while said emulsion is confined within said tube to form a cohesive skin surface thereon as said emulsion is moved through said tube.

3,885,054

EDIBLE COLLAGEN CASING CROSS-LINKED BY BISULFITE ADDITION

Mauj A. Cohly, Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Filed Apr. 26, 1973, Ser. No. 354,727

Int. Cl. A22c *13/00*

U.S. Cl. 426—277 11 Claims

1. In a process for producing an edible collagen casing which comprises extruding an aqueous collagen slurry through a die into an aqueous coagulating medium to form a thin-walled tubular collagen casing, hardening the tubular casing, and drying to produce an edible casing product, the improvement for hardening said tubular collagen casing which comprises:

forming a bisulfite addition product with said collagen by contacting said collagen with a bisulfite providing material selected from the group consisting of alkali metal and ammonium sulfite, alkali metal and ammonium bisulfite, alkali metal and ammonium hydrosulfite, and sulfurous acid at a pH and temperature effective for forming said bisulfite addition product, and

subsequently decomposing said bisulfite addition product to form a reactive aldehyde which then reacts with functional groups on said collagen to crosslink and harden the thinwalled tubular collagen casing.

3,885,055

Patent Not Issued For This Number

3,885,056

METHOD OF COOKING FOOD PRODUCTS

Donald Paul Smith, and Raymond E. Booth, both of Dallas, Tex., assignors to Donald P. Smith, Dallas, Tex.

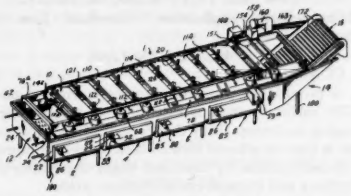
Division of Ser. No. 209,132, Dec. 17, 1971, Pat. No. 3,731,614. This application Mar. 2, 1973, Ser. No. 337,675

Int. Cl. A23l *1/00*

U.S. Cl. 426—441 6 Claims

1. A method of cooking pieces of a food product comprising the steps of: forming compartments; positioning pieces of food products in each compartment; moving the compartments through a trough containing liquid; circulating liquid heated to a first temperature upwardly through said compartments and across the pieces of the product in a direction transverse to the

length of the trough in a first portion of the trough; circulating liquid heated to a second temperature, lower than the first temperature, upwardly through said compartments and across the pieces of the product in a direction transverse to the length of the trough in a second portion of the trough, said first



portion and said second portion being spaced from one another along the length of said trough; withdrawing liquid from said compartments in a direction transverse to the length of the trough; and controlling the flow rate and the temperature of the circulating liquid in said first portion and said second portion.

3,885,057

PROCESS FOR STERILIZING A PRODUCT

Raoul Wander, Paris, and Robert Angue, Antibes, both of France, assignors to Approvisionnement-Transport Aerien-Distribution, Paris, France

Division of Ser. No. 93,015, Nov. 27, 1970, abandoned, which is a continuation-in-part of Ser. No. 718,044, April 2, 1968, abandoned. This application Nov. 15, 1972, Ser. No. 306,522

Int. Cl. A23c *3/02;* **A23l** *3/00*

U.S. Cl. 426—519 **3 Claims**

1. A process of sterilizing a product in liquid form which may contain microorganisms consisting essentially of subjecting said product simultaneously to internal heat generated within the product by internal friction brought about between rotating substantially planar surfaces in relative movement with respect to said product thereby elevating and maintaining said product, for a few tenths of a second, to a temperature sufficient to destroy microorganisms which may be present in said product by coagulating the protoplasm of the microorganisms; and to a centrifugal force sufficient to destroy said microorganisms by degrading the cell walls of said microorganisms; and to pressure sufficient to prevent thermal shock even at said temperature; whereby said temperature and said centrifugal force pressure possess combined effects sufficient to destroy any microorganisms present to yield a sterilized product with substantially no chemical degradation of physical segregation of the product.

3,885,058

METHOD OF MANUFACTURING CADMIUM SULPHIDE PHOTOCELLS

Thuoc Nguyen Duy, Ivry; Wolfgang Palz, Paris, and Jacques Vedel, Asnieres, all of France, assignors to The Unites States of America as represented by the Secretary of the Navy, Washington, D.C.

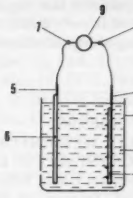
Filed Apr. 27, 1973, Ser. No. 355,147

Claims priority, application France, May 3, 1972, 72.15598

Int. Cl. B44d *1/44, 1/18*

U.S. Cl. 427—10 **2 Claims**

1. In a method for manufacturing a CdS photocell which comprises adhering a collector grid to a layer of Cu_2S, reducing oxidized copper sulfide on the surface of said layer by dipping the photocell to which the grid has just been adhered into an aqueous solution of cuprous ions and then removing the photocell from said solution; the improvement which comprises permitting the reduction of said oxidized copper sulfide by said aqueous solution to proceed until the curve representing the variation with respect to time of the potential difference between the photocell and a pure copper electrode dipped into the same solution, passes through its minimum



value, and then removing said photocell from said aqueous solution.

3,885,059

METHOD FOR FORMING A CARBIDE LAYER OF A IV-GROUP ELEMENT OF THE PERIODIC TABLE ON THE SURFACE OF A CEMENTED CARBIDE ARTICLE

Noboru Komatsu, Toyoakeshi; Tohru Arai, Nagoyashi; Yoshihiko Sugimoto, Nagoyashi, and Masayoshi Mizutani, Nagoyashi, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoyashi, Japan

Filed Apr. 11, 1974, Ser. No. 460,148

Claims priority, application Japan, Apr. 12, 1973, 48-40821

Int. Cl. C23f *7/00;* **B44d** *5/12*

U.S. Cl. 427—12 **7 Claims**

×400

1. A method for the surface treatment of a cemented carbide article, comprising the steps of preparing a treating molten bath consisting essentially of boric acid or borate and a substance containing at least one element of the group consisting of titanium, zirconium and hafnium and immersing the article in the treating molten bath, thereby forming a carbide layer of said element on the surface of the article thus treated.

3,885,060

PRODUCTION OF INSOLUBILIZED ORGANIC POLYMERS

Takako Hirai, Kodaira; Yoshio Hatano, Uenoharamachi; Saburo Nonogaki, Tokyo, and Teruaki Kobayashi, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 852,234, Aug. 22, 1969, abandoned. This application Nov. 29, 1972, Ser. No. 310,583

Claims priority, application Japan, Aug. 23, 1968, 43-59886

Int. Cl. B44d *1/50;* **C08f** *3/16;* **C08g** *30/10*

U.S. Cl. 427—43 **34 Claims**

1. In a method for forming a cathode ray image comprising:

a. providing a substrate;

b. coating said substrate with a cathode ray-sensitive film consisting essentially of an organic polymer; and

c. exposing at least a portion of said cathode ray-sensitive film to a cathode ray beam to effect crosslinking of the polymer whereby said portion of film is insolubilized with respect to certain organic solvents, the improvement wherein the organic polymer is selected from the group consisting of a diene polymer selected from the group consisting of epozidized 1, 4-polybutadiene, epoxidized 1,4-polyisoprene, epoxidized 1, 4-polychloroprene, and epoxidized 1, 2-polybutadiene, and an epoxy-containing

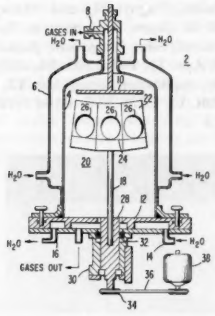
vinyl polymer selected from the group consisting of polyglycidyl methacrylate, polyglycidyl acrylate, a glycidyl methacrylate-acrylonitrile copolymer and a glycidyl acrylate-acrylonitrile copolymer, said organic polymer having a molecular weight of from 100,000 to 10,000,000; the diene polymer having a degree of epoxidation of from 8 to 70%.

3,885,061

DUAL GROWTH RATE METHOD OF DEPOSITING EPITAXIAL CRYSTALLINE LAYERS

John Francis Corboy, Ringoes; Glenn Wherry Cullen, Princeton, and Nicholas Pastal, Trenton, all of N.J., assignors to RCA Corp., Princeton, N.J.

Filed Aug. 17, 1973, Ser. No. 389,192
Int. Cl. C23c *11/00*
U.S. Cl. 117—201 **5 Claims**



1. A method of comprising a composite layer of heteroepitaxial silicon on a heated sapphire or spinel substrate comprising:

depositing a first portion of said layer having a thickness of about 500–2000 A at an average growth rate of about 4–6 μm/min and the remainder of said layer at a rate of not more than about 0.5 μm/min.

3,885,062

PROCESS FOR TREATING MOLDS USED IN MOLDING GLASS PARTS

Frank Bombola, Garden Grove, Calif., assignor to E/M Lubricants, Inc., West Lafayette, Ind.

Filed May 17, 1973, Ser. No. 361,343
Int. Cl. B29c *1/04*
U.S. Cl. 427—133 **9 Claims**

1. A process for treating molds adapted for use in molding glass parts comprising the steps of:

cleaning the surfaces of such molds; and

thereafter, applying to said mold surfaces an aqueous composition comprising a mixture of monoaluminum dihydrogen phosphate, $Al(H_2PO_4)_3$, and a member selected from the group consisting of graphite, carbon black, molybdenum disulfide, tungsten disulfide, molybdenum diselenide, molybdenum telluride, iron oxide, lead sulfide and molybdenum, tungsten, chromium, and carbides thereof, and mixtures thereof,

whereby a sacrificial protective coating is provided on the mold surfaces thereby facilitating release of molded glass parts and protecting the surface of the mold.

3,885,063

PROCESS FOR PROTECTING A METALLIC SURFACE AGAINST CORROSION AND WEAR

Herbert Schachner; Helmut Tannenberger, and Bastian O. Baumberger, all of Geneva, Switzerland, assignors to Battelle Memorial Institute, Carouge, Geneva, Switzerland

Filed June 17, 1974, Ser. No. 480,152
Claims priority, application Switzerland, June 15, 1973, 8705/73
Int. Cl. C23c *11/08*
U.S. Cl. 427—226 **5 Claims**

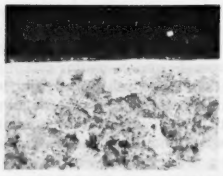
1. A process for protecting against corrosion and wear a metallic surface consisting essentially of at least one element belonging to Group IB of the Periodic Classification of Elements in pure or alloyed form, which process comprises forming on said surface by chemical vapor deposition a layer of amorphous and transparent aluminium oxide.

3,885,064

METHOD FOR FORMING A CHROMIUM CARBIDE LAYER ON THE SURFACE OF AN IRON, FERROUS ALLOY OR CEMENTED CARBIDE ARTICLE

Noboru Komatsu, Toyoakeshi; Tohru Arai, Nagoyashi; Yoshihiko Sugimoto, Nagoyashi, and Masayoshi Mizutani, Nagoyashi, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoyashi, Japan

Filed Apr. 11, 1974, Ser. No. 460,149
Claims priority, application Japan, Apr. 12, 1973, 48-40823; June 22, 1973, 48-69752
Int. Cl. B44d *1/06*
U.S. Cl. 427—228 **9 Claims**



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1. A method for forming a carbide layer on the surface of an iron, ferrous alloy or cemented carbide article in a treating molten bath, comprising the steps of preparing the treating molten bath consisting essentially of chromium halide and a member selected from the group consisting of boric acid, borate and the mixture thereof, immersing the article containing at least 0.05% of carbon into said treating molten bath, keeping said article in said treating molten bath for forming a chromium carbide layer on the surface of said article, and taking said article out of said treating molten bath.

3,885,065

HYDRATED METAL OXIDE DEPOSITION

George O. Suman, Jr.; Edwin A. Richardson, both of Houston, and Ronald F. Scheuerman, Bellaire, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 221,401, Jan. 27, 1972, Pat. No. 3,756,315. This application Feb. 12, 1973, Ser. No. 331,939The portion of the term of this patent subsequent to Sept. 4, 1990, has been disclaimed.
Int. Cl. B44d *1/02*
U.S. Cl. 427—230 **3 Claims**

1. A process for depositing a strongly adherent hydrated metal oxide coating on a surface of a solid material that is located within a relatively inaccessible region into which a fluid can be flowed, which process comprises:

compounding a basic aqueous solution of an amphoteric metal oxide and a pH-reducing reactant that subsequently

lowers the pH of the solution to one at which a hydrated metal oxide is precipitated after a time sufficient for the solution to be flowed from the location in which it is compounded to the location in which it contacts the surface of the material to be coated; and

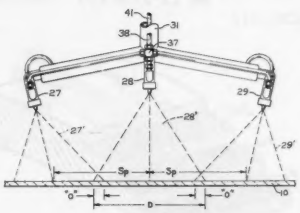
flowing the solution into contact with and along the surface of the material to be coated while the precipitation of the hydrated metal oxide is occurring so that a relatively uniform coating of a relatively insoluble hydrated metal oxide is deposited over substantially all of that surface and is deposited at a relatively slow rate.

3,885,066

METHOD FOR COATING CONTINUOUSLY ADVANCING SUBSTRATE

Ronald L. Schwenninger, Cumberland, Md., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 24, 1972, Ser. No. 309,049
Int. Cl. C23c *7/00*
U.S. Cl. 427—314 **19 Claims**



1. In a method of coating a surface of a glass substrate continuously advancing along a predetermined path, the coating method comprising the steps of directing a coating medium as a diverging stream from each of at least two coating dispensing means toward the surface of the substrate at sufficient velocity to impinge on the surface of the substrate to coat same, and cyclically displacing the at least two dispensing means along a reciprocating path transverse to the predetermined path of the substrate to coat the surface of the substrate, wherein the improvement provides the surface of the substrate with a substantially uniform coating and comprises: performing the displacing step with the at least two dispensing means on a center-to-center spacing as measured (1) at the substrate surface to be coated and (2) along the substrate path a distance approximately equal to S_p for each cyclic traverse of the at least two dispersing means along the reciprocating path wherein S_p is

$$\frac{R_s}{F_m}\left(\frac{N_o+n}{N_o}\right)$$

wherein:

R_s = the speed at which the substrate is advancing, in inches per minute;

N_o = the number of dispensing means;

n = any positive or negative whole integer other than $n = N_o$ or any multiple of $n = N_o$; and

F_m = the cycle speed of the dispensing means, in cycles per minute.

3,885,067

METHOD FOR TREATING A POLYESTER SYNTHETIC FIBER FOR USE AS A RUBBER-REINFORCING MATERIAL

Hiroaki Ishika, Ohiso; Koji Maruyama, Chigasaka, and Kenzi Katsushima, Hiratsuka, Japan, assignors to The Yokohama Rubber Co. Ltd., Tokyo, Japan

Filed May 18, 1973, Ser. No. 361,762
Claims priority, application Japan, May 29, 1973, 47-53121
Int. Cl. B32b *25/08, 27/36*
U.S. Cl. 427—381 **8 Claims**

1. A process for treating a polyester fiber for use as rubber reinforcement comprising the steps of applying to said polyester fiber a solution comprising the reaction product which is obtained by reacting an excess of resorcinol with an allyl halide and an alkali metal hydroxide, drying said polyester fiber and further applying to said polyester fiber resorcinol-formalin resin latex.

3,885,068

EMULSIFIED ASPHALT EMULSION FORTIFIED WITH ASBESTOS FIBERS

Clarence R. Bresson, and Forrest D. Spaulding, Bartlesville, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 22, 1972, Ser. No. 308,697
Int. Cl. B44d *1/02;* **C08h** *13/00*
U.S. Cl. 427—394 **9 Claims**

1. A method for preparing an asphalt impregnated nonwoven polyolefin fabric material capable of withstanding fluid or hydraulic pressure tending to cause the asphalt to extrude from the fabric, which comprises prewetting asbestos fibers having a fiber length of about 0.01–0.1 inches with a nonionic surface-active agent, blending enough of the thus-treated asbestos fibers with an anionic asphalt emulsion to obtain a stable emulsion mixture containing about 4–15 parts of asbestos fibers per 100 parts of asphalt emulsion, applying such stable emulsion mixture to said fabric in an amount sufficient to insure the filling of the interstices of the fabric, and curing the coating thus obtained.

3,885,069

PREPARATION OF CROSSLINKED POLYETHYLENIMINE AND IMPREGNATION OF CELLULOSIC MATERIAL WITH IN SITU CROSSLINK-POLYMERIZED ETHYLENIMINE

Earl J. Roberts, and Stanley P. Rowland, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 11, 1972, Ser. No. 279,919
Int. Cl. C02b *1/46;* **D06m** *13/48, 15/12*
U.S. Cl. 427—396 **5 Claims**

1. A method for producing in situ formed, crosslinked polyethyleniminé in a fibrous material, the method comprising:

a. mixing ethylenimine with an alkyl halide selected from the group consisting of 1,2-dichloroethane, tris(2-chloroethyl)phosphoramide, bis(2-chloroethylinyl)-phosphonate, tris(2,3-dibromopropyl)phosphate, tris(1,3-dichloroisopropyl)phosphate, B,B′-dichloroethyl ether and dichloromethane in a molar ratio of about from 44:1 to 27:1;

b. allowing the mixture to stand at 10° to 50° C for from 2 to 16 hours, thereby forming a prepolymer;

c. diluting the mixture in water or ethanol to obtain a 5 to 50 percent concentration of the prepolymer;

d. impregnating the fibrous material with the prepolymer of step (c) to obtain a wet pickup of about from 50 to 150 percent; and

e. allowing the impregnated material to dry at about 25° C until the prepolymer is crosslinked and polymerized.

3,885,070
SELF-ADHESIVE CLOSURE

John C. Chapman, Western Springs, Ill., assignor to Avery Products Corporation, San Marino, Calif.

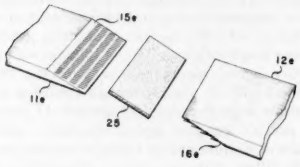
Filed July 26, 1973, Ser. No. 382;755
Int. Cl. B32b *3/14*
U.S. Cl. 428—42 **6 Claims**

1. A flexible web product comprising an elongated carrier web strip having a release-coated surface, a plurality of closure webs in a row along the length of said web strip, each of said closure webs having a pressure-sensitive adhesive face adhered to said release-coated surface, said strip having a longitudinal split along its length separating said strip into first and second strip portions with said closure webs bridging said portions, only said second portion having a plurality of transverse cross slits or notches extending to but not beyond said longitudinal split and separating said second portion into a plurality of discrete carrier strips each backing one portion of its own closure web.

3,885,071
FIBER-REINFORCED EPOXY COMPOSITE JOINTS

Leiv H. Blad, Van Nuys, and Robert F. Warkow, Granada Hills, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Aug. 10, 1972, Ser. No. 279,703
Int. Cl. B32b *3/10, 5/12*
U.S. Cl. 428—60 **3 Claims**



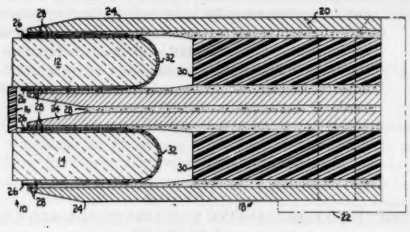
1. An improved fiber-reinforced epoxy composite joint comprising at least a pair of fiber-reinforced epoxy composite adherends having ends scarfed and mated in complementary relation to each other across an unsupported adhesive, all bonded together, each of such adherends having a plurality of layers of substantially equally exposed lengths of inert fibers disposed within and extending unidirectionally from its scarfed mating surface substantially parallel to the longitudinal axis of the elements-to-be-joined and being intermeshed with like lengths of fibers extending from the other adherend.

3,885,072
ATTACHMENT OF RIGID MEMBERS TO FRANGIBLE WINDOW PANELS

George Zibritosky, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 85,153, Oct. 29, 1970, abandoned, which is a continuation-in-part of Ser. No. 829,366, June 2, 1969, abandoned. This application May 3, 1973, Ser. No. 357,055
Int. Cl. B32b *1/04, 3/02, 17/06;* **C03c** *27/08;* **E06b** *3/24*
U.S. Cl. 428—38 **12 Claims**

1. A panel assembly comprising a panel of brittle sheet material selected from the group consisting of glasses, ceramics, graphites, carbon-like materials, plastics and combinations thereof, a ductile metallic foil having a first major surface thereof rigidly bonded by a high temperature resistant, high strength resinous cement to portions of a major surface of said brittle sheet material and a rigid edge attachment extending beyond the periphery of said brittle sheet material, for attachment to a panel assembly support, and being rigidly bonded by a high temperature resistant, high strength resinous

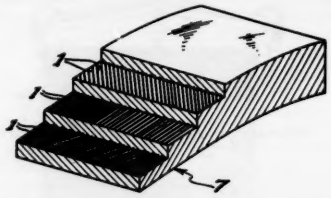


cement to the thicknesswise opposite major surface of said ductile foil.

3,885,073
PRE-STRESSED PYROLYTIC GRAPHITE-REFRACTORY CARBIDE MICROCOMPOSITES

Eugene L. Olcutt, Falls Church, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Continuation-in-part of Ser. No. 65,899, Aug. 21, 1970, Pat. No. 3,738,906. This application Apr. 12, 1973, Ser. No. 350,550
Int. Cl. B32b *5/12*
U.S. Cl. 428—112 **27 Claims**



1. A pre-stressed pyrolytic graphite microcomposite comprising crystallite layers of pyrolytic graphite containing embedded therein codeposited crystals of a refractory carbide selected from the group consisting of silicon, zirconium, hafnium, titanium, tantalum, and niobium carbide, and mixtures thereof, in which the concentration of the codeposited refractory carbide crystals relative to the concentration of pyrolytic graphite adjacent at least one surface of the microcomposite is less than the concentration of said codeposited crystals interiorly of said surface, the concentration of the codeposited crystals in the total microcomposite being in the range of about 5 to 95 percent by volume.

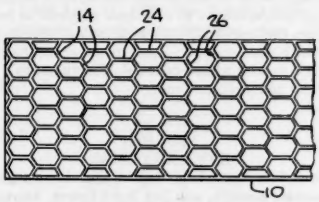
3,885,074
THERMOPLASTIC NET

Edmond A. Chandler, Northwood, N.H., assignor to Breveteam S.A., Fribourg, Switzerland

Division of Ser. No. 145,663, May 21, 1971, Pat. No. 3,769,120, which is a division of Ser. No. 733,576, May 31, 1968, Pat. No. 3,616,152. This application Sept. 6, 1973, Ser. No. 394,776. The portion of the term of this patent subsequent to Oct. 30, 1990, has been disclaimed.
Int. Cl. B32b *3/10;* **B65b** *53/06;* **B29f** *5/00*
U.S. Cl. 428—136 **2 Claims**

1. A thermoplastic film or sheet product having openings forming a net-like pattern or configuration determined by laterally interspaced lines of interrupted slits or cuts with the solid portions between each line overlapped by the slits or cuts of adjacent lines and which are initially formed in unslit or uncut thermoplastic film or sheet and thereafter opened to form said openings; wherein the improvement comprises said

openings being defined by net-work linking portions comprising shrunken or retracted segments of initially unshrunk or unretracted shrinkable or retractable thermoplastic film or



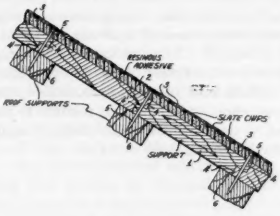
sheet in which said slits or cuts were formed, said segments being shrunk or retracted via the solid portions of the film or sheet between said slits or cuts.

3,885,075

COMPOSITE SLATE STRUCTURE

Elmer A. Ferrante, Easton, Pa., assignor to Elmer A. Ferrante; Frank LaBarba, both of Easton and Alexander D. Ricci, Huntingdon Valley, all of, Pa., part interest to each.

Filed Oct. 1, 1973, Ser. No. 402,271
Int. Cl. E04c *1/40;* **B32b** *3/00*
U.S. Cl. 428—150 **7 Claims**



1. A roofing material comprising a solid support of such thickness that it is not rigid, a first layer of a substantially weather resistant, crack resistant, non-rigid cured resinous adhesive adhering a first layer of individual slate chips of at least one to about 100 square millimeters in area to a surface of said support, so as to cover at least 60% of said surface, a second layer of said cured resinous adhesive adhering a second layer of individual slate chips of at least one to about one hundred square millimeters in area to said first layer and covering at least 60% of said first layer of said chips, and a third layer of said cured resinous adhesive adhering a third layer of individual slate chips of at least one to about one hundred square millimeters in area to said second layer and covering at least 60% of said second layer of said chips.

3,885,076

ELECTRON BEAM GENERATED PATTERNS OF METAL-CONTAINING POLYMERS

Robert Darrow Heidenreich, Warren Township, Somerset County, and Larry Flack Thompson, Gillette, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 9, 1973, Ser. No. 358,731
Int. Cl. B44d *1/18;* **B05c** *5/00*
U.S. Cl. 428—195 **7 Claims**

1. A method of product fabrication comprising the formation of a patterned layer of matter upon a substrate and, optionally, further processing steps, which said formation includes directing a beam of electrons against a selected portion of a layer of an organo-metallic di-π-cyclopentadienyl compound on a substrate thereby cross-linking the compound of the selected portion, wherein the compound contains di-π-cyclopentadienyl M in a relative concentration such that at least one atom of M is present in the layer for every 500 carbon atoms, where M is at least one member selected from the group consisting of Fe, Ni, Co, V, Cr, and Ti.

3,885,077

FLOATABLE RUBBERIZED FABRIC

Jack M. Lederman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 8, 1972, Ser. No. 313,284
Int. Cl. D06m *15/28*
U.S. Cl. 428—265 **1 Claim**

1. A rubberized fabric capable of floating on water consisting essentially of a polypropylene fabric with a coating of a vulcanized natural rubber composition thereon, said rubber composition having a specific gravity no greater than 0.99 and being comprised of natural rubber, sulfur curative, and filler.

3,885,078

HYDROGEL LAMINATES AND METHOD OF MANUFACTURING THEREOF

Otto Wichterle, and Karel Kliment, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation of Ser. No. 802,202, Feb. 25, 1969, abandoned. This application Nov. 22, 1971, Ser. No. 201,236
Claims priority, application Czechoslovakia, Mar. 26, 1968, 1767-68
Int. Cl. B32b *3/26, 7/02*
U.S. Cl. 428—315 **1 Claim**

1. A laminate product comprising at least (A) one preformed film layer of an initially soluble non-crosslinked homogeneous polymer formed from a solution of a copolymer of ethylene glycol monomethacrylate with ethylene glycol dimethacrylate and adhered thereto (B) a thicker layer of a spongy hydrophilic hydrogel polymerized in-situ thereon, said hydrogel being formed from a mixture containing at least 60 percent by weight of water and a copolymer of a glycol monomethacrylate monomer selected from the group consisting of ethylene glycol monomethacrylate, diethylene glycol monomethacrylate, triethylene glycol monomethacrylate and mixtures thereof, propylene glycol monomethacrylate, and copoly-condensates thereof with ethylene glycol with up to 2 percent ethylene glycol dimethacrylate formed in the presence of a polymerization initiator, said two layers being bound together as a result of said polymerization, said film layer (A) rendered substantially insoluble by the existence of chemical bonds formed by cross-linking during polymerization of the monomer mixture for said spongy hydrogel with said film layer (A).

3,885,079

PHOSPHATE COATED POLYMERIC SHAPED OBJECTS

Vernon C. Haskell, and James L. Hecht, both of Richmond, Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 273,301, July 19, 1972, Pat. No. 3,821,014, which is a continuation-in-part of Ser. No. 182,641, Sept. 22, 1971, abandoned. This application Mar. 28, 1974, Ser. No. 455,805

Int. Cl. C01b *25/36;* **B32b** *23/04*

U.S. Cl. 428—346 **6 Claims**

1. A cellophane film having a substantially continuous, gasimpermeable coating on at least one surface thereof, the coating comprising aluminum orthophosphate wherein the atom ratio of aluminum to phosphorus is about from 2.3 to 0.5

3,885,080

CELLULOSIC FILM BASE ASSEMBLY

Frank Percy Lambert, Homchuck, and Edward William Lee, Romford, both of England, assignors to Ilford Limited, England

Filed Oct. 12, 1972, Ser. No. 297,086

Claims priority, application United Kingdom, Nov. 3, 1971, 51157/71

Int. Cl. B44d *1/16*

U.S. Cl. 428—336 **9 Claims**

1. A cellulosic film base assembly which comprises a nitrocellulose cell pse triacetate or cellulose acetate-butyrate film base bearing in order on at least one side thereof a protective layer not more than 1 μ thick which layer comprises a mixture of a cellulosic polymer and a polyester-based polyurethane which contains no free isocyanate groups and which is soluble in ethyl alcohol or acetone or a mixture of ethyl alcohol and acetone and, coated on said protective layer, a lacquer layer, the range of polyurethane to cellulosic polymer to be used in the layer on the cellulosic film base being from 2 parts by weight of the polyurethane to 1 part by weight of the cellulosic polymer to 1 part by weight of the polyurethane to 2 parts by weight of the cellulosic polymer.

3,885,081

SHEET MATERIAL

August Jean Van Paesschen, Antwerpen; Lucien Janbaptist Van Gossum, Kontich, and Jan Jozef Priem, Mortsel, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Division of Ser. No. 165,312, July 23, 1971, Pat. No. 3,788,856, which is a division of Ser. No. 763,382, Sept. 27, 1968, Pat. No. 3,649,336. This application Feb. 12, 1973, Ser. No. 331,349

Claims priority, application United Kingdom, Aug. 12, 1968, 44114/68

Int. Cl. B44d *1/18;* **G03c** *1/80*

U.S. Cl. 428—474 **1 Claim**

1. Sheet material comprising a hydrophobic film support, a first layer directly adherent to said hydrophobic film support and comprising a copolymer formed from 45 to 99.5percent by weight of at least one vinylidene chloride or vinyl chloride monomer, from 0.5 to 10percent by weight of an ethylenically unsaturated hydrophilic monomer, and from 0 to 54.5percent by weight of at least one other copolymerizable ethylenically unsaturated monomer; a second layer adjacent said first layer comprising in a ratio of 1:3 to 1:0:5percent by weight a mixture of gelatin and a copolymer of 30 to 70percent by weight of butadiene with at least one copolymerizable ethylenically unsaturated monomer; and in exterior relation to said second layer in successive order a hydrophilic electroconductive layer and electrically insulating layer.

3,885,082

ELECTRIC ARC FURNACE SIDE-WALL PROTECTION ARRANGEMENT

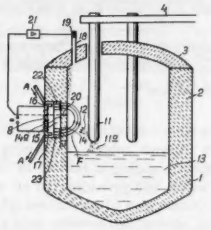
Bertil Hanas, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Apr. 17, 1974, Ser. No. 461,693

Claims priority, application Sweden, Apr. 19, 1973, 7305609

Int. Cl. F27d *1/00*

U.S. Cl. 13—35 **6 Claims**



1. An electric arc furnace comprising at least one electrode having an end forming an arc producing an arc flare, a side wall lining having at least one portion having an inside positioned to be bombarded by said flare, said portion having an outside, a magnet having pole-piece ends on said outside forming a magnet flux field traveling through said portion and beyond said inside and on said inside holding ferro-magnetic particles forming a flare shield until the particles are heated to their Curie point temperatutes, and a feeder for feeding said field with replacement ferro-magnetic particles at temperatures lower than their Curie point temperatures; wherein the improvement comprises said lining having an outer surface in which a recess is formed at said portion so that said portion has a reduced wall thickness through which said flux field must travel, and means between said magnet and recess for water-cooling said portion of reduced wall thickness, said water-cooling means including magnetic pole piece extensions extending substantially from said pole piece ends to said inside of said portion.

3,885,083

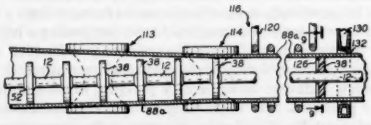
PRESSURE FUSED WATERTIGHT DISC COAXIAL CABLE

Ludwik Jachimowicz, Elizabeth, and Jerzy A. Olszewski, Edison, both of N.J., assignors to General Cable Corporation, Greenwich, Conn.

Division of Ser. No. 321,641, Jan. 8, 1973, Pat. No. 3,807,031. This application Dec. 14, 1973, Ser. No. 424,904

Int. Cl. H01b *9/04, 11/18*

U.S. Cl. 174—28 **9 Claims**



1. A coaxial cable comprising a center conductor and an outer conductor of substantially larger diameter than the center conductor and spaced therefrom, discs on the center conductor holding the outer conductor in spaced relation to the inner conductor including imperforate discs of dielectric material bonded to both the inner and outer conductors at spaced regions along the cable and forming separate watertight compartments therealong, and other discs of dielectric material having better attenuation characteristics than the first discs and located between the first discs in positions for providing additional mechanical support for the outer conductor at regions between the discs that form the watertight compartments.

3,885,084

STRUCTURE FOR SEALING A JOINT IN AN ELECTROMAGNETIC SCREENING ENCLOSURE

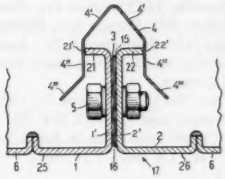
Hans-Peter Kaiserswerth, Regensburg; Klaus Kowalkowski, Munich, and Siegfried H. Benedikter, Taufkirchen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 11, 1973, Ser. No. 405,395

Claims priority, application Germany, Oct. 16, 1972, 2250639

Int. Cl. H05k *9/00*

U.S. Cl. 174—35 MS **7 Claims**



1. A structure sealing a joint in an electro-magnetic screening enclosure, the joint being between a pair of wall members with each member having a first flange extending the length of the member and at an angle to said member, each of said first flanges terminating in a second flange extending at an angle to said first flange and having a free edge, said members being held together by threaded fasteners with said first flanges of the members being in facing relationship and said second flanges being adjacent each other and on opposite sides of the residual gap of the joint with their free edges facing in opposite directions, said structure comprising an electrically conductive cover member of a resilient metal, said cover member having a pair of spaced portions and being detachably mounted on said wall members with the spaced portions of the cover member engaging the free edges of the adjacent second flanges, electrically interconnecting the wall members and covering the gap.

3,885,085

HIGH VOLTAGE SOLID EXTRUDED INSULATED POWER CABLES

George Bahder, Edison; George S. Eager, Jr., Upper Montclair, and David A. Silver, Livingston, all of N.J., assignors to General Cable Corporation, Greenwich, Conn.

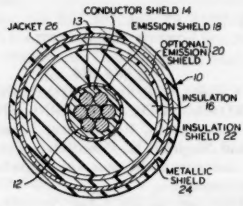
Filed June 11, 1974, Ser. No. 478,329

Int. Cl. H01b *9/02*

U.S. Cl. 174—36 **14 Claims**

1. An electric power cable including in combination a conductor, a conductor shield surrounding the conductor, insulation around the conductor shield, the shield including an inner

layer made of semi-conducting material and the shield having an outer layer of material that prevents emission of electrons



into the insulation from regions of high electrical stress in the semi-conducting inner layer.

3,885,086

SPACER-DAMPER ASSEMBLY

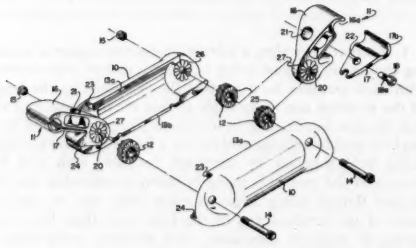
Herbert James Houston, 1453 Segram Ave., Oakville, Ontario; Kenneth Dale Bolt, 827 Francis Rd., Burlington, Ontario; Adolf Gretzinger, 138 Fallingbrook Dr., Ancaster, Ontario, and Robert Gordon Baird, 310 N. Shore Blvd., Burlington, Ontario, all of Canada

Continuation of Ser. No. 182,327, Sept. 21, 1971, abandoned. This application Sept. 4, 1973, Ser. No. 394,110

Claims priority, application Canada, July 22, 1971, 118839

Int. Cl. H02g *7/14, 7/12*

U.S. Cl. 174—42 **32 Claims**



29. A cable damper for an aerially suspended conductor in bundled configuration, comprising a rigid metallic body having a plurality of metallic clamping arms adapted to engage respective sub-conductors of the conductor bundle, said clamping arms being pivotally connected to the main body by pivot mountings adapted to permit pivotal movement of the clamping arms about predetermined axes parallel to the sub-conductors, said pivot mountings including resilient energy absorbing means adapted to damp vibrational movements of the clamping arms, and each said energy absorbing means comprising a replaceable element of semi-conducting synthetic polyisoprene which is frictionally engaged between relatively movable surfaces of a clamping arm and the main body.

30. A cable damper for an aerially suspended conductor in bundled configuration comprising a rigid main body having a plurality of clamping arms pivotally connected thereto with resilient energy absorbing means adapted to damp vibrational movements of the clamping arms, characterized in that the main body consists of a pair of complementary half shells clamped together in edge abutting relation by clamping bolts.

3,885,087

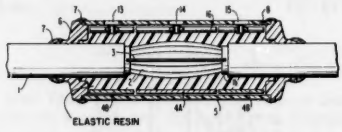
AIR TIGHT RESIN FILLED CONNECTION POINT DAM FOR COMMUNICATION CABLES

Toshihisa Takada, and Yukio Matsui, both of Tokyo, Japan, assignors to Fujikura Cable Works, Ltd., Tokyo, Japan

Filed July 17, 1973, Ser. No. 380,025

Int. Cl. H02g *15/24, 15/08*

U.S. Cl. 174—93 **7 Claims**



1. A connecting zone connecting two insulated communication cables, each of said cables comprising an electrically insulating sheath surrounding a bundle of electrically insulated conductor wires, and providing an air tight connecting zone around the connection of the cables which comprises a polyethylene outer sleeve surrounding said connecting zone and fixed to each of said electrically insulating sheaths by a pair of spacer means welded to said insulating sheaths and to said outer sleeve, and inner spring sleeve means disposed inwardly of said polyethylene outer sleeve and surrounding the connection zone of the communication cables, said connecting zone being filled with a synthetic resin having a rubber-like elasticity.

3,885,088

FULLY-FILLED TELEPHONE CABLE WITH IMPROVED SCREEN

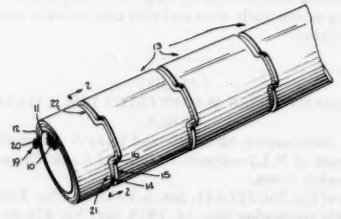
Antonio Ferrentino, Monza, Italy, assignor to Industrie Pirelli Societa per Azioni, Milan, Italy

Filed May 2, 1974, Ser. No. 466,177

Claims priority, application Italy, May 23, 1973, 24440/73

Int. Cl. H01b *7/18*

U.S. Cl. 174—102 D **5 Claims**



1. A telephone cable comprising a core including a plurality of insulated conductors surrounded by a composite tape folded longitudinally around said core to thereby form a tube of said tape around said core, said tape comprising a layer of metal having a layer of synthetic resin on and bonded to at least the outwardly facing surface of said layer of metal, said tube being indented at each of a plurality of longitudinally spaced positions with a plurality of indentations extending circumferentially of said core, the sum of the circumferential lengths of said indentations being at least equal to the circumference of said core, each of said indentations having an inner surface conforming to the exterior surface of said core and having a circumferential length less than the circumference of said core, at least one of said indentations at each of said positions being longitudinally and circumferentially displaced with respect to, but longitudinally adjacent, at least one other of said indentations at said last-mentioned position and said indentations at each position being disposed around said core with each so-displaced indentation overlapping at least one other indentation and with the inner surface of each so-

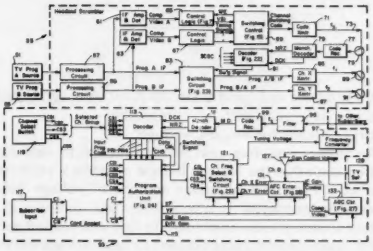
displaced indentation forming a continuation of the inner surface of the adjacent indentation to provide substantially circumferentially continuous engagement of the inner surfaces of said indentations with the exterior surface of said core at each said position whereby said core is encircled at longitudinally spaced positions by a circumferentially extending, reentrant tube inner surface portion which is in substantially continuous engagement with said core.

3,885,089

TELEVISION SCRAMBLING SYSTEM

Richard T. Callais, Northridge, and D. Paul Warther, Playa Del Rey, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 16, 1973, Ser. No. 333,231
Int. Cl. H04n *1/44*
U.S. Cl. 178—5.1 **12 Claims**



1. A subscription television scrambling and unscrambling system for selectively transmitting a plurality of television programs on a plurality of transmission channels from a central station to each of a plurality of subscriber sites; said system comprising:

central station equipment comprising:

first means for deriving a first signal from a first television program signal;

second means for deriving timing signals from a second television program signal;

third means coupled to said first and second means for developing a channel switching code in response to the first signal and timing signals;

fourth means coupled to said third means for enabling the channel switching code to be transmitted to the subscriber sites in the system;

fifth means having first and second output circuits, said fifth means being coupled to said fourth means for selectively alternating the first and second television program signals between said first and second output circuits at preselected times determined by a sequence of channel switching codes in order to respectively develop third and fourth scrambled television program signals at said first and second output circuits;

first and second transmitting means respectively coupled to said first and second output circuits for transmitting to each of the subscriber sites the third and fourth television program signals within the first and second transmission channels, respectively; and

equipment at each subscriber site comprising:

a frequency converter responsive to the plurality of transmission channels for converting any selected transmission channel to a predesignated transmission channel;

sixth means for developing signal information in response to each channel switching code received from the central station;

seventh means coupled to said sixth means for utilizing the signal information therefrom to generate first and second switching signals when a subscriber is authorized to receive a scrambled television program on a transmission channel selected by the subscriber; and

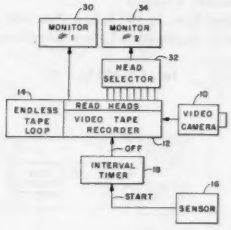
switching means coupled between said seventh means and said frequency converter for selectively developing and applying first and second tuning voltages to said frequency converter in response to said first and second switching signals, said frequency converter being responsive to the selective application of the first and second tuning voltages for causing the desired one of the first and second television programs to be developed within the predesignated transmission channel.

3,885,090

CONTINUOUS AUTOMATIC SURVEILLANCE SYSTEM

Richard W. Rosenbaum, 2618 Colonial Way, Bloomfield Hills, Mich. 48013

Filed Mar. 20, 1973, Ser. No. 343,041
Int. Cl. H04n *5/78*
U.S. Cl. 178—6.6 A **14 Claims**



1. A surveillance system for providing a recorded video image of a guarded area, comprising video camera means producing a video output signal representing an image of the area under surveillance, an endless magnetic tape loop on which video signals can be stored, video recorder means normally continuously on operatively connected to said video camera means for continuously recording said video signals on said endless tape loop, said recorder means including an endless tape loop transport system including a plurality of center-feeding reels, means for feeding said tape from one reel to the next in a closed path including all of said reels, and means for maintaining the amount of tape wound on at least one of said reels different from the amount of tape wound on other ones of said reels, said video recorder means further providing write head means and a plurality of read head means between a plurality of adjacent ones of said reels, interval timing means operatively connected to said video recorder means for turning said recorder means off following a predetermined interval of time after said timing means is started, and sensor means responsive to a predetermined disturbance in said guarded area for issuing a signal to said interval timing means to start said timing means, whereby upon the sensing of a disturbance, said video recorder means is turned off after a predetermined interval of time.

3,885,091

METHOD AND APPARATUS FOR PIPELINE INSPECTION

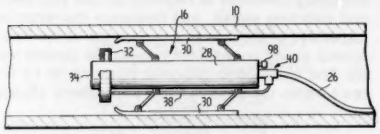
Harold D. Fish, and Karl H. Kalberer, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 24, 1973, Ser. No. 409,159
Int. Cl. H04n *7/18*
U.S. Cl. 178—6 **15 Claims**

1. A method for inspecting underground pipelines wherein a camera is transported through the pipeline comprising:

illuminating with radiation having a wavelength in the range of about 750 to 1,000 nanometers the pipeline sidewall surface area closest to and within the viewing angle of

said camera as said camera moves through the pipeline; viewing the pipeline sidewall surface area with said camera; and



sensing the image viewed by said camera responsive to the range of radiation illuminating said pipeline sidewall surface area.

3,885,092

CINEMATOGRAPHIC FILM PROJECTOR

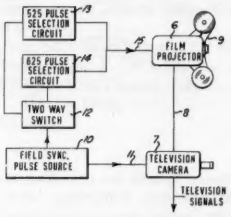
John David Millward, Hitchin, England, assignor to Decca Limited, London, England

Filed Apr. 5, 1973, Ser. No. 348,205

Claims priority, application United Kingdom, Apr. 28, 1972, 19932/72

Int. Cl. H04n *5/38*

U.S. Cl. 178—7.2 **1 Claim**



1. A system for deriving signals for reproducing video information from cinematographic film in television systems, comprising: a film projector including an intermittently operable film traversing mechanism; a television camera; a source of regular field synchronizing pulses for the television camera; means for operating the film traversing mechanism in response to some of the pulses; two pulse selection circuits for passing some of said field synchronizing pulses to the operating means; a selectively operable two-way switch having two alternative outputs; a first one of said pulse selection circuits comprising a first divide-by-two logic unit, whose input is connected to one of the two alternative outputs of the two-way switch, thereby to pass to said operating means every alternate field synchronizing pulse, whereby each film frame is scanned twice; the other pulse selection circuit comprising a second two-way switch which has an input connected to the other of the said two alternative outputs of the first two-way switch, and two outputs, one of said outputs being connected to an input of a divide-by-three logic unit for producing an output pulse in response to three pulses from the second two-way switch, the other of said outputs being connected to the input of a second divide-by-two logic unit for producing an output pulse in response to two pulses from the second two-way switch, an "OR" gate having two inputs, each input being connected to an output of one of the logic units, and a switch actuating device responsive to each pulse at the output of the "OR" gate for switching the input of the second two-way switch from one to the other of its outputs thereby to pass to said operating means selected field synchronizing pulses, the selected pulses being separated alternately by one and two non-selected pulses, whereby alternate film frames are scanned twice and three times, the outputs of the "OR" gate and of the first divide-by-two logic unit being connected to the operating means; said selectively operable first two-way switch being operative for selectively switching the field pulses to one or other of said pulse selection circuits.

3,885,093

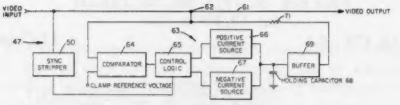
FAST ACTING DIRECT CURRENT CLAMPING CIRCUIT

Daniel L. Mooney, Marcola, Oreg., assignor to Ampex Corporation, Redwood City, Calif.

Continuation-in-part of Ser. No. 240,729, April 3, 1972, Pat. No. 3,748,386. This application June 14, 1973, Ser. No. 370,138

Int. Cl. H04n *5/18;* **H03k** *5/08*

U.S. Cl. 178—7.3 DC **4 Claims**



1. A circuit for clamping a circuit point in a signal path to a particular reference voltage, comprising:

a storage means for holding voltage;

buffer means coupling said storage means to said circuit point such that the voltage thereat assumes a value determined by the instantaneous amount of voltage held by said storage means;

current source means responsive to first and second successive commands to pass current to said storage means to charge same to a voltage, said current source means responsive to the first of said successive commands to pass current to said storage means to charge same in a first direction to a voltage different than a voltage corresponding to said particular reference voltage, said current source means responsive to the sound of said successive commands to pass current to said storage means to charge same in a second direction opposite the first direction until the stored voltage reaches said voltage corresponding to said particular reference voltage;

command generator means responsive to each one of periodically occurring pulse signals to generate said first and second successive commands;

impedance isolation means connected to said circuit point; and

means including a comparator having a first input coupled to said impedance isolation means to receive a signal representative of the voltage level at said circuit point and a second input coupled to receive a signal representative of the reference voltage, said comparator responsive to the voltage level at said circuit point obtaining said particular reference voltage while said currrent sources means passes current to said storage means in response to the second of said successive commands to terminate the passage of current to said storage means until the next pulse signal is received by said command generator means.

3,885,094

OPTICAL SCANNER

James T. Russell, Richland, Wash., assignor to Battelle Development Corporation, Columbus, Ohio

Division of Ser. No. 202,471, Nov. 26, 1971, Pat. No. 3,806,643, which is a continuation-in-part of Ser. No. 857,474, Sept. 12, 1969, Pat. No. 3,624,284, which is a division of Ser. No. 576,580, Sept. 1, 1966, Pat. No. 3,501,586. This application Oct. 12, 1973, Ser. No. 405,770

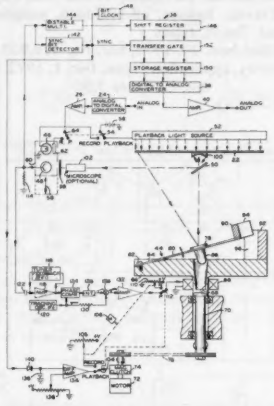
Int. Cl. H04n *1/24*

U.S. Cl. 178—7.6 **5 Claims**

1. Optical scanner apparatus comprising:

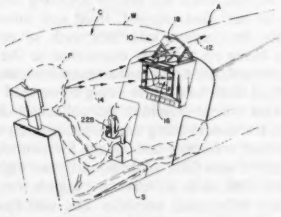
a rotatable support,

a resilient arm member fixed at one end to said support,
a mirror attached to said arm member,
motor means for rotating said support,
deflection means for bending said arm member in response to an electrical control signal to radially move said mirror during rotation of said support in order to provide the



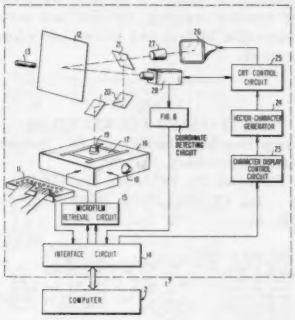
mirror with a spiral-shaped scan track on an image plane, and
compensation means for moving said mirror away from the image plane as said mirror is deflected radially inward along said scan track in order to maintain the optical path length between the mirror and the image plane substantially constant during scanning.

3,885,095
COMBINED HEAD-UP MULTISENSOR DISPLAY
Gerald Wolfson, and Eric R. Fehr, both of Los Angeles, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed Apr. 30, 1973, Ser. No. 357,125
Int. Cl. H04n *7/18*
U.S. Cl. 178—7.88 **10 Claims**



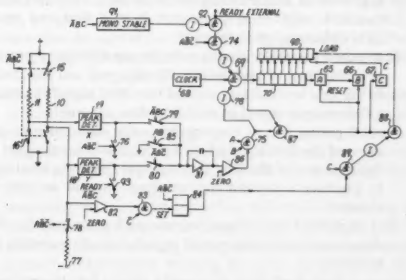
5. A display system for an aircraft comprising:
a display device having a face on which images are formed;
first mirror means in front of said face, said first mirror means for reflecting light from the face of the display device and for transmitting light;
second semi-reflecting mirror means positioned above the first mirror means mounted in the field of view of an aviator in the aircraft for displaying an external scene of view and the images from said display device; and
collimating means positioned between said first and second mirror means for collimating light from the face of the display device so that the collimated image on the face of the display device is reflected from the second mirror means toward the aviator;
the face of said display device positioned to be viewable through said first mirror means, so that the aviator can see the uncollimated image on the face of the display device by looking downwardly from the position of the second mirror means.

3,885,096
OPTICAL DISPLAY DEVICE
Masafumi Inuiya, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed July 13, 1973, Ser. No. 378,861
Claims priority, application Japan, July 15, 1972, 47-70942
Int. Cl. G08b *5/00*
U.S. Cl. 178—15 **12 Claims**



1. An optical display device comprising a screen for optically displaying an image record, means for making a light spot impinge on the screen at a desired position on said image record, means for photoelectrically converting said position of the light spot into an electric control signal which is fed to a computer, and an information retrieval device in which a new image recorded on a film corresponding to said position is projected on the screen under the control of an output signal from the computer.

3,885,097
GRAPHICAL INPUT APPARATUS FOR ELECTRICAL APPARATUS
Peter John Pobgee, Surbiton, England, assignor to National Research Development Corporation, London, England
Filed Aug. 11, 1972, Ser. No. 279,774
Int. Cl. G08c *21/00*
U.S. Cl. 178—18 **24 Claims**



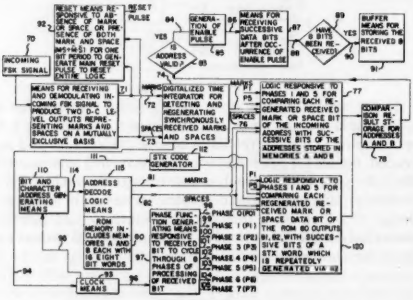
1. Apparatus for obtaining signals indicative of the coordinates of a point indicated on a surface, including a continuous sheet held parallel and adjacent to, but not in contact with the continuous planar surface of a member, the sheet and

the member comprising electrically resistive material, the sheet being of such material and so mounted that it is able to make contact temporarily with the planar surface over a relatively small area when pressed towards the surface by means for indicating the position of a point, means positioned between the sheet and the planar surface to prevent contact between the sheet and the surface over relatively large areas, change-over means for causing current supplied to the apparatus to flow alternately in two paths; a first path in which the current flows in a substantially single direction through the sheet, and a second path in which the current flows in a substantially single direction, at an angle to the other current direction, through the resistive member, and means for deriving a first signal giving the value of the voltage of the resistive member when current flows in the sheet and a second signal giving the value of the voltage of the sheet when current flows through the resistive member, the first and second signals being representative of first and second co-ordinates of the point, respectively.

3,885,098
DIGITALIZED FSK RECEIVER

Edward Camp Dowling, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 29, 1973, Ser. No. 410,931
Int. Cl. H04l *27/14*; **H04b** *1/16*
U.S. Cl. 178—88 **13 Claims**



1. A digitalized means for reproducing mark and space representing pulses from an FSK signal, having first segments thereof at a first frequency and representing binary 1's, and second segments thereof at a second frequency and representing binary 0's, and further having a nominal bit rate R_b, and comprising:

first and second data channels;

demodulating means responsive to said first and second segments of said FSK signal to produce first and second two level signals, respectively, in said first and second data channels, respectively;

first gating means responsive to the simultaneous presence of a first level of said first two level signal and the absence of the first level of said second two level signal to produce a first output signal in said first data channel;

second gating means responsive to the simultaneous presence of the first level of said second two level signal and the absence of the first level of said first two level signal to produce a second output signal in said second data channel;

first digitalized time measuring means for determining if the duration of said first output signal exceeds a certain time interval;

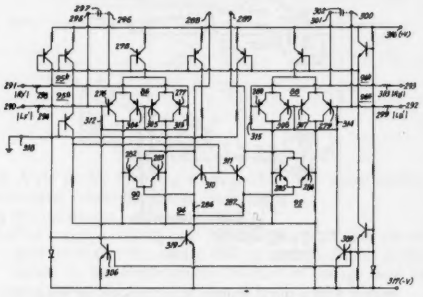
second digitalized time measuring means for determining if the duration of said second output signal exceeds a certain time interval; and

first and second storage means responsive to the determination by said first or second time measuring means, respectively, that said first or second output signal has exceeded said certain time intervals, to assume a state indicative of the reception of a mark or a space, respectively.

3,885,099
INTEGRATED LOGIC CIRCUIT FOR THE DECODER OF A MULTI-CHANNEL STEREO APPARATUS

Katsuaki Tsurushima, Kawasaki; Yoshio Ota, Fujisawa, and Masashi Takeda, Isehara, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 29, 1973, Ser. No. 419,933
Claims priority, application Japan, Dec. 1, 1972, 47-121039
Int. Cl. H04r *5/00*
U.S. Cl. 179—1 GQ **9 Claims**



1. In a multi-channel stereo apparatus which has decoder means for decoding two composite signals into at least first, second, third and fourth decoding output signals each containing a dominant signal component and at least one subdominant signal component, logic means for detecting the dominant signal component contained in each of said decoding output signals and producing first and second control signals, and variable transmission means for varying the transmitting conditions for said decoding output signals in response to said control signals; said logic means being in the form of an integrated circuit comprising first, second, third, fourth, fifth, sixth, seventh and eighth transistors each having a base, emitter and collector, said first and second transistors constituting a first differential amplifier, said third and fourth transistors constituting a second different amplifier, means for applying said first, second, third and fourth decoding output signals to the bases of said first, second, third and fourth transistors, respectively, the bases of said fifth, sixth, seventh and eighth transistors being respectively connected to the collectors of said first, second, third and fourth transistors, the collectors of said fifth and sixth transistors being connected to each other and to a first output terminal, the collectors of said seventh and eighth transistors being connected to each other and to a second output terminal, and means for connecting together the emitters of said fifth, sixth, seventh and eighth transistors so that said fifth, sixth, seventh and eighth transistors constitute a third differential amplifier and said first and second control signals are respectively obtained at said first and second output terminals.

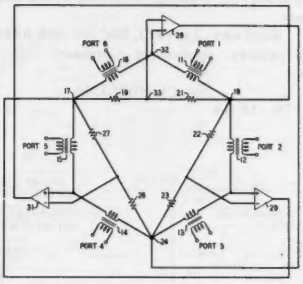
3,885,100
SIX-PORT CONFERENCE AMPLIFIER CIRCUIT

James Richard Stidham, Broomfield, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 31, 1974, Ser. No. 474,879
Int. Cl. H04m *3/56*, *3/40*
U.S. Cl. 179—1 CN **6 Claims**

1. A telephone conference amplifier circuit comprising six coupling means each one of which is associated with an external port, all of said coupling means internally connected in a hexagonal ring, three pairs of substantially equal value resistors, each said pair being respectively connected to the cou-

pling means of adjacent pairs of ports to form three balanced bridge circuits, a differential amplifier means connected to each bridge circuit for detecting and amplifying signals origi-



nating in that bridge, and means for coupling the output of each amplifier means to the common point between the other two bridges, thus coupling a signal from one port into the other ports of the amplifier.

3,885,101

SIGNAL CONVERTING SYSTEMS FOR USE IN STEREO REPRODUCING SYSTEMS

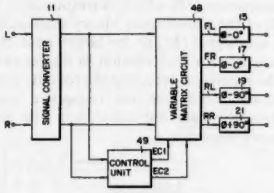
Ryosuke Ito, and Susumu Takahashi, both of Tokyo, Japan, assignors to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1972, Ser. No. 315,928

Claims priority, application Japan, Dec. 21, 1971, 46-103970

Int. Cl. H04r *5/00*

U.S. Cl. 179—1 GQ **20 Claims**



1. A signal converting system for reproducing stereophonically related first and second channel signals from a two-channel signal source by means of a four-channel stereo reproducing system, said system comprising a combination of:

first signal converting means connected to receive the first and second channel signals for producing first and second composite signals by combining the first and second channel signals;

a control unit responsive to the phase relationship between the first and second composite signals for producing first and second control outputs, the levels of which vary in opposite relationship; and

second signal converting means connected to receive the first and second channel signals for producing four-channel output signals by combining the first and second channel signals, said second signal converting means including means for controlling at least a relative amplitude ratio between the first and second channel signals contained in each of a pair of output signals in accordance with the level of said first control output and means for controlling at least a relative amplitude ratio between the first and second channel signals contained in each of another pair of output signals in accordance with the level of said second control output.

3,885,102

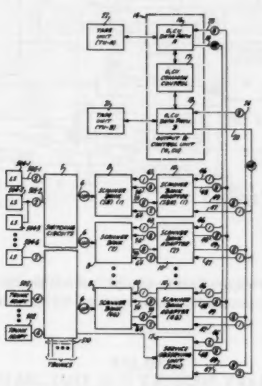
MESSAGE METERING SYSTEM HAVING MULTI-LEVEL SIGNALS AND PARTY DISCRIMINATION

Gary C. Henrickson, Palo Alto, and John C. McDonald, Los Altos, both of Calif., assignors to Vidar Corporation, Calif.

Filed Sept. 10, 1973, Ser. No. 396,092

Int. Cl. H04m *15/10*

U.S. Cl. 179—7 R **20 Claims**



1. A message metering apparatus for metering subscriber usage of a telephone system, said telephone system including a plurality of subscribers having associated subscribed lines, including a plurality of trunk circuits having associated trunk lines, and including switching circuits for connecting the subscriber lines to the trunk lines, the improvement comprising, multi-level signal generator means connected to said trunk circuits for generating multi-level subscriber signals associated with each calling subscriber where the multi-level signals represent information about subscriber usage of the telephone system, and

metering means connected to the subscriber lines for periodically addressing a subscriber line for each subscriber and for sensing the associated multi-level signals for each calling subscriber for metering subscriber usage of the telephone system.

3,885,103

AUTOMATIC BRANCH EXCHANGE USING TIME DIVISION SWITCHING

William Ralph Smith, and Herman Deutsch, both of Raleigh, N.C., assignors to Tele/Resources, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 291,960, Sept. 25, 1972, Pat. No. 3,825,693. This application July 2, 1973, Ser. No. 375,741

Int. Cl. H04q *3/54*

U.S. Cl. 179—15 AT **23 Claims**

1. A time division multiplex automatic branch exchange for a telephony system comprising:

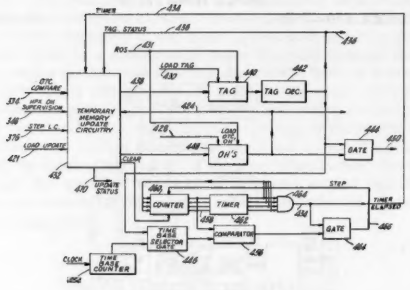
a time division switch for gating signals between discrete audio paths during selected periodically recurring time slots;

a temporary memory for recording information relating to each recurring time slot defined by the switch;

decoder means for reading in sequence from the temporary memory information relating to each time slot of the system and providing inputs to said time division switch identifying the paths to be gated together during that time slot;

a permament memory having recorded therein a series of coded operating instructions for establishing connections via the time division switch; and

update circuit means responsive to said permanent memory for recording in the temporary memory equipment addresses corresponding to equipment within the system to be interconnected through the time division switch.



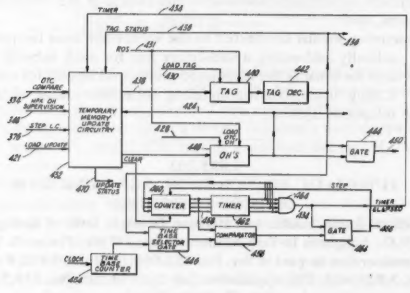
3,885,104
TEMPORARY MEMORY FOR TIME DIVISION MULTIPLEX TELEPHONY SYSTEM EXCHANGES

William Ralph Smith, and Herman Deutsch, both of Raleigh, N.C., assignors to Tele/Resources, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 291,960, Sept. 25, 1972, Pat. No. 3,825,693. This application July 2, 1973, Ser. No. 375,790

Int. Cl. H04g *3/54*

U.S. Cl. 179—15 AT **7 Claims**



1. In a time division switching private automatic branch exchange, a temporary memory for providing constantly updated information concerning the connection established within each time slot comprising a plurality of equal length recirculating shift registers each having at least one bit position for each recurring time slot and a common clock pulse source connected to each shift register to advance all such shift registers in synchronization, a first group of said shift registers defining at least two address fields for recording binary information identifying the equipment interconnected through each time slot, and a second group of shift registers including at least one storage element associated with each address field for recording therein the on-hook or off-hook status of equipment identified by that field.

3,885,105
CODE MULTIPLEX METHOD USING A BINARY CHANNEL

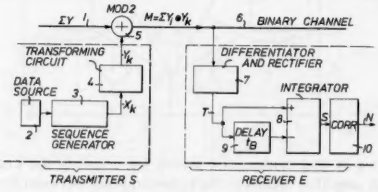
Rupert Hildenbrand, Ulm, Danube, Germany, assignor to Licentia-Pantent-Verwaltungs-G.m.b.H, Frankfurt am Main, Germany

Filed Oct. 23, 1973, Ser. No. 408,639

Claims priority, application Germany, Oct. 26, 1972, 2252540

Int. Cl. H04j *3/08*

U.S. Cl. 179—15 BA **6 Claims**



1. A method of transmitting data via a binary transmission channel between a plurality of data sources and a plurality of receivers according to the code multiplex method comprising the steps of:

providing the data to be transmitted from each of the data sources in the form of a receiver-specific coded binary sequence (X_k) per data bit;

transforming each of the coded binary sequences (X_k) to a respective transformed binary sequence (Y_k) which changes its polarity per bit clock pulse whenever a bit of the original binary sequence (X_k) is present;

adding the transformed binary sequences (Y_k) of the individual data sources in mod **2** with a shift in phase to form a binary sequence (M) which corresponds to the mod **2** sum of all of the transformed binary sequences (Y_k);

feeding the sum signal (M) to the binary data channel as a binary sequence for transmission to the receivers; and

at each of the receivers, detecting the specific coded binary sequence associated with the respective receiver and regenerating the data bits associated with the specific coded binary sequence.

3,885,106
TELEPHONE EXCHANGE HAVING PERMANENT MEMORY FOR OPERATING INSTRUCTIONS

Herman Deutsch, Raleigh, N.C., assignor to Tele/Resources, Inc., White Plains, N.Y.

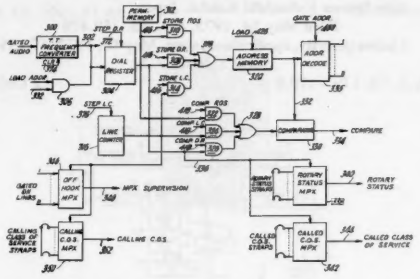
Continuation-in-part of Ser. No. 291,960, Sept. 25, 1972, Pat. No. 3,825,693. This application July 2, 1973, Ser. No. 375,740

Int. Cl. H04q *3/54*

U.S. Cl. 179—18 J **8 Claims**

1. A branch exchange for a telephony system comprising a plurality of interconnectable equipments each forming a source of audio signals, temporary memory means for recording equipment addresses and status information relating to each recurring time slot within the system, a read only memory having recorded therein a multiplicity of binary coded words forming instructions for the automatic establishment and disestablishment of time division connections within the system, each instruction including one or more words and all words of each instruction occupying sequential address positions within the memory, a source of clock pulses occurring at predetermined intervals, address register means responsive to said clock pulses for accessing sequential instructions within said memory, data register means for receiving the output of the memory, decoder means for identifying instructions which require more than one clock cycle for execution, clock pulse gating means for blocking clock pulses from reaching the

address register, and search frame counter means responsive to the decoder means for activating the clock pulse gate



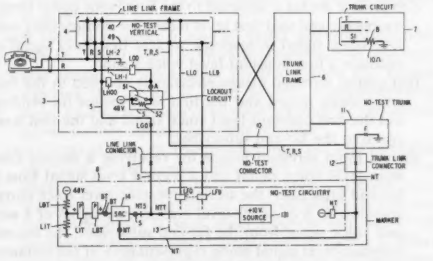
means for an interval equal in duration to one complete frame of time slots.

3,885,107

PERMANENT SIGNAL LOCKOUT INTERFACE CIRCUIT

Mark Charles Stern, New York, N.Y., assignor to American Telephone and Telegraph, New York, N.Y.

Filed May 6, 1974, Ser. No. 467,101
Int. Cl. H04m *3/00*
U.S. Cl. 179—18 FA 11 Claims



1. For use in a telephone switching system having circuitry which produces a low impedance ground on the sleeve lead during a normal busy condition and a high impedance ground on said sleeve lead during a permanent signal busy condition, a marker having no-test circuitry for accessing lines to check for trouble conditions thereof, a line busy relay to determine whether said lines are busy or idle, and a source of potential, the combination comprising:

an impedance connected to said sleeve lead,

latch switch means,

means responsive to a no-test call for enabling said latch switch means,

means responsive to a busy ground on said sleeve lead for triggering said enabled latch switch means and connecting said impedance to said source of potential, and

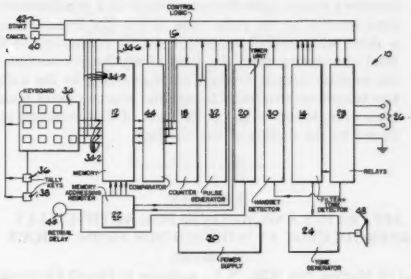
output means for forwarding a normal busy signal to said marker when said busy ground is a normal low impedance busy ground, but for switching said normal busy signal to an idle signal in a time insufficient to operate said line busy relay when said busy ground is a high impedance permanent signal ground.

3,885,108

TELEPHONE DIALING SYSTEM

Joseph Zock, St. Kilda Residential Hotel, Abel Rd., Berea, Johannesburg, South Africa

Filed Apr. 16, 1973, Ser. No. 351,451
Int. Cl. H04m *1/44*
U.S. Cl. 179—90 B 10 Claims



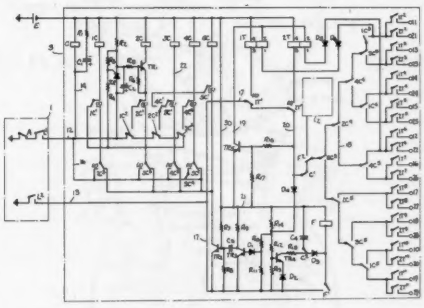
6. A device as claimed in claim 4, which includes indicating means operable to give a visual indication of the number stored.

3,885,109

RELAY TELEPHONE DIAL PULSE REGISTER

Kengo Sudoh, Kawasaki, and Fumio Tsutsumi, Yokohama, both of Japan, assignors to Nippon Tsu Shin Kogyo K.K., Kanagawa, Japan and TIE/Communications, Inc., Stamford, Conn., part interest to each

Filed Mar. 23, 1973, Ser. No. 344,199
Claims priority, application Japan, Jan. 13, 1973, 48-12511
Int. Cl. H04m *1/26*
U.S. Cl. 179—99 3 Claims



1. In a relay operated telephone dial pulse register circuit having an input from a telephone line circuit and multiple output terminals, a C position relay, which operates, and is held operated, upon the application of the first dial impulse input to the register, and releases in response to a minimum predetermined interdigital pause in the dial impulses at the end of the impulse train, a plurality of counting relays, including a first and second counting relay with contacts to connect the register output terminals to the telephone line circuit, and a final connecting relay for connecting the register output terminal to the key telephone extension corresponding to the number dialled into the register, the register additionally comprising;

a first semiconductor control circuit means connected to the second counting relay for controlling the operation of the second counting relay to prevent the operation of the

second counting relay during the occurrence of a pulse which operates the first counting relay, said pulse occurring in a pulse train dialed into the register and said control circuit means operating the second counting relay during a subsequent pulse of the pulse train corresponding to the dialed number;

a second semiconductor control circuit means connected to the counting relays for controlling the release of the counting relays upon the occurrence of a predetermined time interval in the pulse train of the dial impulses; and a third semiconductor control circuit connected to the final connecting relay for controlling the connection of the register output contact corresponding to the called key telephone extension to a signal source circuit means after completion of the pulse train of dial impulses produced by the dialing of the number.

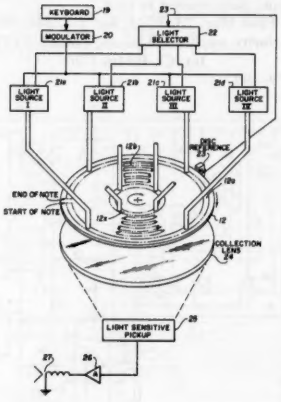
3,885,110
APPARATUS AND METHOD FOR ARTIFICIALLY REPRODUCING AT WILL SOUNDS FROM UNIQUE SOURCES

Paul Di Matteo, Dix Hills, N.Y., assignor to Dynell Electronics Corporation, Melville, N.Y.

Continuation-in-part of Ser. No. 245,484, April 19, 1972, abandoned. This application Oct. 15, 1973, Ser. No. 406,236

Int. Cl. G11b *7/00, 31/02, 27/24*

U.S. Cl. 179—100.3 B **8 Claims**



1. In a method for reproducing instantaneously on command recorded sound generated by a unique source including musical notes, vocal phonemes, words and the like, in which the recorded sound envelope highest frequency, as represented by f_h, is low as compared to the recorded sound carrier fundamental frequency f_f, the steps of commanding the pickup of the desired sound, picking up a signal representing the recorded sound substantially instantaneously by beginning at any random point in the record within the range from the actual beginning of the sound to a subsequent point substantially proximate to an interval defined by the expression $1/f_h$ where f_h is the highest frequency component in the frequency spectrum in the recorded sound envelope, and converting the signal to an audible sound.

3,885,111
TERMINAL EQUIPMENT FOR LINCOMPEX TELEPHONE SYSTEM

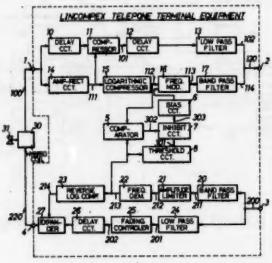
Hikoichi Ishigami; Akira Sato; Seishi Kitayama, and Kouhei Kobayashi, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed May 14, 1973, Ser. No. 359,878

Claims priority, application Japan, May 15, 1972, 47-47905

Int. Cl. H04b *3/20*

U.S. Cl. 179—170.8 **2 Claims**



1. A terminal equipment for a lincompex telephone system comprising:

first input terminal means for receiving a first voice signal from a near-end subscriber;

first level means connected to the first input terminal means for producing a first level signal representative of the instantaneous level changes of the first voice signal and having a different frequency range than said first voice signal;

compressor means connected to the first input signal terminal means and said first level means for compressing said first voice signal in response to said first level signal to produce a first constant-level voice signal;

first output terminal means electrically coupled to the first compressor means and the first level means for sending out the first constant-level voice signal and the first level signal to the far-end subscriber;

second input terminal means for receiving a second constant-level voice signal and a second level signal from a far-end subscriber, the second constant-level voice corresponding to a constant-level compressed signal of a second voice signal from the far-end subscriber, the second constant-level signal being representative of the instantaneous level changes of the second voice signal;

second level means connected to the second input terminal means for detecting the second level signal;

expander means connected to the second input terminal means and the second level means for reproducing the second voice signal from the second constant-level voice signal and the detected second level signal;

second output terminal means electrically coupled to the expander means for sending out the reproduced second voice signal to the near-end subscriber;

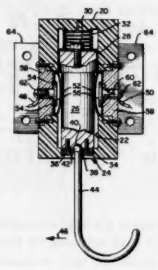
comparator means electrically coupled to said second level means for producing a second control output when the second level signal exceeds a first threshold level;

control means connected to the comparator means and the threshold means for fixing the first level signal to a second threshold level sufficiently lower than the first level signal in response to only the simultaneous existance of the first control signal and the second control signal; and said control means comprising an inhibit circuit for inhibiting the second control signal in response to the first control signal, and a bias circuit connected to the output of the inhibit circuit and the first level means for fixing the first level signal to the second threshold level in response to the output of the inhibit circuit.

3,885,112
VEHICLE CARRIED ENGINE TILT SHUT-OFF SWITCH

Vinal Duncan, 35 Lindsley Dr., Wolcott, Conn. 06716

Filed Nov. 15, 1973, Ser. No. 416,290
Int. Cl. H01h 3/16, 15/14
U.S. Cl. 200—61.44 10 Claims



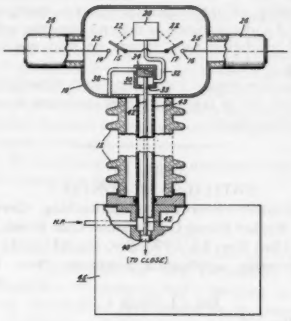
1. An engine tilt shut-off device comprising:
a housing of electrically non-conductive material adapted for mounting approximately centrally on a vehicle and having a lower portion thereof exposed downwardly;
a linearly movable drag member depending from said lower portion of said housing and engaging at its lower end portion the surface beneath the vehicle;
a vertically and linearly slidable member supported within said housing and connected with and carrying said drag member;
resilient means connected between said housing and slidable member and urging said vertically slidable member downwardly whereby to maintain said lower end portion of said drag member in engagement with said subadjacent surface;
said slidable member having an upper and operative position and being urged downwardly therefrom by said resilient means to inoperative positions when the vehicle carrying the device is tilted beyond a predetermined angle causing a release of upward pressure by said subadjacent surface against said drag member;
and electrically conductive means connected with an engine electrical power supply circuit and with said vertically slidable member, said slidable member and conductive means serving cooperatively to close and open said circuit respectively in said upper position and said lower positions of said member whereby automatically to effect engine shut-off operation in response to said predetermined angle of vehicle tilt.

3,885,113
CONTROL FOR AN ELECTRIC CIRCUIT BREAKER WITH VALVE AND PISTON OPERATING MEANS

Philip Barkan, Media, and John A. Oppel, Aldan, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Oct. 19, 1973, Ser. No. 408,013
Int. Cl. H01h 35/38
U.S. Cl. 200—82 B 10 Claims

1. In a control for the control-valve mechanism of an electric circuit breaker, said mechanism comprising a movable control-valve member, an operating piston therefor, and an elongated rod interconnecting said valve member and said operating piston,
a. means biasing said operating piston in a direction to effect a circuit-breaker-closing operation of said valve member,
b. latch means for restraining said operating piston in a circuit-breaker-open position against said bias,
c. a closing-control operator for said latch means operable to release said latch means and thus render the latch means incapable of continuing to restrain said piston in its circuit-breaker-open position, thereby allowing said biasing means to operate said piston in a circuit-breaker-closing direction,
d. an opening-control operator effective when operated to develop an opening-control force for use in driving said operating piston through circuit-breaker-opening control motion,

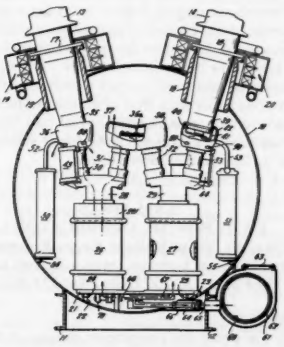


e. force-transmitting means effective when said latch means is reset, but ineffective when said latch means is not reset, for transmitting said opening-control force from said opening-control operator to said operating piston,
f. and latch-resetting means for effectively resetting said latch means following and in response to a release of said latch means.

3,885,114
GAS CIRCUIT BREAKER STATIONARY INTERRUPTER TUBE AND CONTACT SUPPORT

Giovanni Paolo Guaglione, Irvine, Calif., and Hansruedi Aumayer, Harleysville, Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Sept. 19, 1973, Ser. No. 398,874
Int. Cl. H01h 33/82
U.S. Cl. 200—148 R 11 Claims



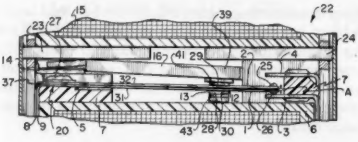
1. In a gas blast circuit breaker; in combination:
a plurality of series connected interrupter structures; each of said interrupter structures comprising an elongated insulation tube, a stationary contact fixed at one end thereof, and a movable contact, movable within said tube between an engaged and disengaged position relative to said stationary contact;

a gas blast valve housing for each of said plurality of interrupter structures;
a metallic tank enclosure for said circuit breaker;
support insulation means secured to and extending upwardly from the bottom of said tank;
terminal bushing means extending into the top of said tank; said gas blast valve housing being connected to the top of said support insulation means;
said plurality of interrupter structures being physically mounted and supported at the end opposite said one end of said insulation tube means on said gas blast valve housing;
and connection means connecting said stationary contacts of at least one of said interrupter structures to said terminal bushing means.

3,885,115
SWITCH-OVER CONTACT

Wolfgang Adalbert Schrotter, Unterhaching, Germany, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Nov. 14, 1973, Ser. No. 415,652
Claims priority, application Germany, Nov. 15, 1972, 2256044
Int. Cl. H01h *1/50*
U.S. Cl. 200—245 **7 Claims**



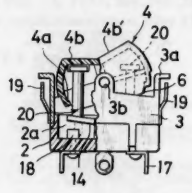
1. In an electrical switching device, the combination of a first and a second fixed contact member in spaced oppositely facing relation to each other, a movable contact element for making contact alternatively to said first or to said second fixed contact member, said movable contact element comprising two contact arms, each arcuately curved when in free state, each having a contacting surface at one end thereof, the other ends of said contact arms being mounted to a fixed support so that their contacting surfaces are in the space between said first and second fixed contact members, and actuating means for moving said movable contact element, including a member engaging both contact arms, the improvement constituted by the sides of said contact arms which are concavely curved in free state facing outwardly from a common line a symmetry between said contact arms as mounted, and the location of said fixed contact members with respect to said contact arms being such that when the contacting surface of one of said contact arms engages one of said fixed contacts, said one of said contact arms has a curvature substantially less than that of its free state conformation.

3,885,116
SWITCH WITH AN INDICATOR

Yasuo Kodaira, c/o Nihon Kaiheki Kogyo Kabushiki Kaisha, 5-14, Minamimagome 1-chome, Ota-ku, Tokyo, Japan

Filed June 18, 1973, Ser. No. 371,072
Int. Cl. H01h *9/16*
U.S. Cl. 200—308 **3 Claims**

1. A switch in which the opening or closing of the switch is performed by inclining an actuator leftward and rightward, said switch comprising:
an actuator formed with the interior thereof being visible from the exterior;
an indicating piece provided within a cavity located below said actuator;
a coil spring interposed between a supporting cylinder of said indicating piece and a supporting member of an indicating plate inserted into said supporting cylinder to bring an upper surface of said indicating plate and an inside upper surface of said actuator into contact with each other when said actuator is inclined;
a pin secured to said supporting member through an elongated hole provided in said supporting cylinder;

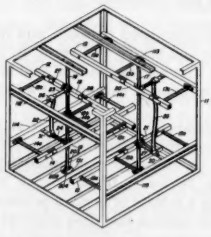


whereby the indication on said indicating piece is indicated on the surface of said actuator by bringing said indicating plate and the inside of said actuator into contact with each other.

3,885,117
BALANCED LINE SWITCH SYSTEM

Kenneth Owen, 6201 Hibling Ave., Springfield, Va. 22150

Filed Apr. 3, 1974, Ser. No. 457,615
Int. Cl. H01h *21/18*
U.S. Cl. 200—153 S **15 Claims**



1. A switch system for interconnecting a plurality of balanced input lines to a plurality of balanced output lines, said switch system comprising:
a. a plurality of switch modules, each of said modules having a pair of balanced input line conductors and a pair of balanced output line conductors, said modules being interconnected with adjacent balanced line conductors interconnected to thereby define a crossbar matrix,
b. each module also defining a pair of rotatable means for rotation between a first through position and a second cross connect position, each of said means defining an input line through connect portion, an output line through connect portion, and a cross connect portion,
c. each pair of cross connect portions being of equal length and defining parallel helix portions having substantially 90° of rotation.

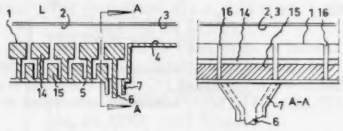
3,885,118
MICROWAVE OVEN HAVING CONTROLLED WAVE PROPAGATING MEANS

Bo Valtersson Valtersson, Hagersten, Sweden, assignor to Husqvarna Vapenfabriks AB, Huskvarna, Sweden

Continuation of Ser. No. 184,169, Sept. 27, 1971, abandoned. This application May 4, 1973, Ser. No. 357,279
Int. Cl. H05b *9/06*
U.S. Cl. 219—10.55 F **2 Claims**

1. A microwave oven comprising: means for generating microwave energy within a given frequency range; a cavity for

receiving material to be treated with microwave energy, said cavity having conducting walls and openings therethrough, through which openings said material to be treated is fed in and withdrawn; a plurality of devices for attenuating and restricting microwave energy to prevent leakage through said openings, at least one of said plurality of devices being positioned within the cavity at each of said openings, each said device including: a base, and a plurality of parallel spaced apart electrically conducting elements conductively disposed on and supported by said base, said spaced elements being



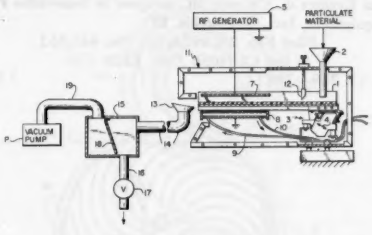
arranged in groups and defining a structure which is periodic in the direction of wave propagation, said electrical conducting elements being shaped and oriented with respect to one another so as to constitute a predetermined mutual capacitance and inductance defining a high-pass filter means which propagates incoming microwave energy within the given frequency range with counter-directional phase velocity and group velocity, the phase velocity of the waves in said high-pass filter means being at least as great as the phase velocity at which the microwave energy is propagated in the vicinity of said device within the cavity.

3,885,119

APPARATUS FOR AGGLOMERATING AND/OR DRYING AND STERILIZING PARTICULATE MATERIAL

Ralph G. Sargeant, 408 W. Windsor St., Lakeland, Fla. 33803

Filed Apr. 18, 1974, Ser. No. 461,963
Int. Cl. H05b *9/04*
U.S. Cl. 219—10.81 **10 Claims**



1. In an apparatus for accomplishing thermal treatment, as in agglomerating, drying and sterilizing, of particulate solid materials having a significant moisture content, the combination of

two elongated electrodes of substantial width arranged one above the other and spaced apart by a significant distance to define a treating zone;

at least one of said electrodes being hollow and equipped with inlet and outlet means for the flow of a cooling liquid therethrough;

means for operatively connecting the electrodes to a radio frequency generator;

conveyor means extending between said electrodes and through said treating zone in a direction lengthwise of the electrodes,

said conveyor means having a supporting surface which has an input end and a discharge end and is at least substantially as long and wide as the electrodes and is capable of receiving and supporting a relatively thin bed of the particulate material,

said conveyor means comprising vibrating means connected to vibrate said surface to both agitate the particulate material and cause the particulate material to move from the input end to the discharge end of said supporting surface,

there being a substantial free space between said supporting surface and the upper one of said two electrodes, which space can be occupied by a gaseous atmosphere of predetermined temperature and humidity,

said vibrating means being constructed and arranged to impart to said surface vibratory motion having components directed respectively toward and away from said upper electrode; and

means for supplying particulate material to the input end of said supporting surface.

3,885,120

ELECTRODE AND FLUX COMBINATION FOR SUBMERGED ARC WELDING

Joseph Ropitzky, Waterford, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 3, 1973, Ser. No. 376,259
Int. Cl. B23k *9/18*
U.S. Cl. 219—73 **2 Claims**

2. In a submerged arc method of welding a medium carbon, nickel-chromium-molybdenum-vanadium steel to produce a weld deposit having the following composition by weight: 0.22 percent carbon, 0.34 percent manganese, 0.20 percent silicon, 3.25 percent nickel, 0.83 percent chromium, 0.65 percent molybdenum, 0.08 percent vanadium, 0.08 percent maximum copper, 0.04 percent aluminum, 0.008 percent maximum phosphorus, 0.008 percent sulfur, and the balance of iron, the weld deposit being heat-treatable to a room temperature yield strength of 162 ksi, a ductility as measured by a reduction in area of 56 percent, and a Charpy V-notch impact resistance of 25 ft/lbs at −40°F, the improvement of tailoring the compositions of the electrode wire and the neutral silicate-base flux utilized therewith to provide the desired percentages of silicon and the manganese in the weld deposit, comprising the steps of,

limiting the wire to a silicon content of about 0.03 percent by weight and a manganese content of about 0.48 percent by weight, and

limiting the flux to a silicon content of about 2.25 percent by weight and a manganese content of about 0.04 percent by weight.

3,885,121

METHOD FOR ELECTROSLAG WELDING OF COPPER BLANKS

Daniil Andreevich Dudko, per. Mechnikova, 3, kv. 7, Kiev; Alexei Pavlovich Alexeenko, Brovarskogo raiona, ul. Chapaeva, 50, Vigurovschina Kievskoi oblasti; Ivan Ivanovich Lychko, ul. Sapernoe pole, 28, kv. 11, Kiev; Valentin Mikhailovich Iljushenko, ul. Vladimirskaya, 98/3, kv. 38, Kiev; Igor Ivanovich Suschuk-Sljusarenko, ul. Vyborskaya, 80/17, kv. 94, Kiev; Alexandr Grigorievich Tarnovsky, Teplichny per., 5, kv. 14, Moscow; Dmitry Nikolaevich Kostevich, kvartal 2, dom 20a, kv. 1, Shelekhov Irkutskoi oblasti; Jury Iosifovich Andrusenko, ul. Kurchatova, 13, kv. 66; Samuil Markovich Gurevich, bulvar Lesi Ukrainki, 2, kv. 2, both of Kiev, and Gennady Nikolaevich Strakhov, ul. Petrozavodskaya, 32, korpus 2, kv. 216, Moscow, all of U.S.S.R.

Continuation of Ser. No. 260,730, June 8, 1972, abandoned. This application Mar. 4, 1974, Ser. No. 448,051
Int. Cl. B23k *25/00*
U.S. Cl. 219—73 **4 Claims**

1. A method for electroslag welding of copper blanks employing a slag bath contained in a pocket formed by a base plate, supporting blocks under the copper blanks, the copper

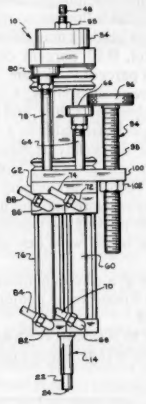
blank surfaces to be welded, covering blocks resting on top of the copper blanks and back-up plates covering the sides of the gap between the copper blanks, said method comprising the steps of pouring a molten flux comprising alkali metal and alkaline earth metal fluorides into said pocket to form a slag bath, immersing a non-consumable electrode into said slag bath, applying voltage across said non-consumable electrode to heat the slag bath until the blank edges being welded start melting, replacing the nonconsumable electrode by a consumable, laminated copper electrode to establish a molten metal bath, directing a stream of coolant on said molten metal bath as it emerges into the gap between the blank surfaces to be welded in order to cool the weld below its crystallization front, wherein said base plate, supporting blocks, covering blocks and back-up plates are formed of a heat-insulating material being a more active oxygen absorbent than copper and having a thermal conductivity lower than copper, so that the heat of the slag bath is retained and complete fusing of the weld metal and copper blank metal occurs.

3,885,122

WELDING APPARATUS

James C. Morris, Elyria, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Aug. 28, 1973, Ser. No. 392,204
Int. Cl. B23k *9/20*
U.S. Cl. 219—98 **18 Claims**



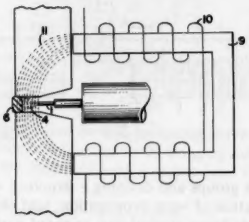
1. Stud welding apparatus comprising a plunger member mounted for movement among an upper position, an intermediate position, and a lower position; chuck means attached to said plunger member for movement therewith and for holding a weldable stud with one end thereof extending out of the chuck means; first means including first support means mounted for longitudinal movement with respect to said plunger member, for holding said plunger member at said intermediate position and for enabling said plunger member and said chuck means to drop to said lower position to enable the one end of said stud to strike a workpiece; second means including second support means mounted for longitudinal movement with respect to said plunger member, for moving said plunger member and said chuck means from said lower position in a straight line to said upper position above the workpiece, for holding said plunger member and said chuck means in said upper position, and for enabling said plunger member and said chuck means to move downwardly in a straight line from said upper position to said intermediate position; and means for producing an electrical potential between the stud and the workpiece to cause the stud to be fused to the workpiece when they come in contact.

3,885,123

METHOD AND MEANS FOR CONTROLLING ADJACENT ARCS

Albert M. Sciaky, Palos Park, and Richard W. Reynolds, Hazel Crest, both of Ill., assignors to Welding Research, Inc., Chicago, Ill.

Filed Aug. 20, 1973, Ser. No. 390,066
Int. Cl. B23k *9/08*
U.S. Cl. 219—123 **10 Claims**



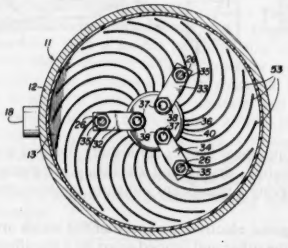
1. A method of electric arc welding along the line between two adjacent or adjoining work-pieces using two separate arcs in close proximity to one another which are formed between the said workpieces and separate conductive materials supported by or passing through separate welding torches, comprising the steps of causing electric currents to flow through each of the said electrically conductive materials and across the said electric arcs, generating a separate magnetic field in association with each of said arcs, causing the said magnetic fields to flow along paths transverse to the line of weld and across each of the said arcs in such a direction as to create forces which act upon each of said arcs to counteract the magnetic force between the two arcs caused by the current flowing in each of the arcs.

3,885,124

ELECTROLYTIC STEAM GENERATOR

Orest Kozinczuk, Chicago, Ill., assignor to Innovative Process Equipment, Inc., Bensenville, Ill.

Filed Feb. 25, 1974, Ser. No. 445,562
Int. Cl. H05b *3/60;* **F22b** *1/30*
U.S. Cl. 219—288 **7 Claims**



1. An electrolytic steam generator, comprising
a tank enclosing a steam generating chamber,
an electrode support in the form of a vertically disposed post,
a plurality of electrodes of substantially the same size and shape mounted in mutually spaced apart relationship within said chamber,
said electrodes radiating outwardly from said post and being equally spaced apart throughout the mutually facing areas thereof,

said electrodes each being in horizontal cross-section in the shape of the involute of a circle,

means connecting said electrodes to a source of electric power to provide a voltage differential between adjacent ones of said electrodes,

a water inlet to said tank,

a drain outlet from said tank, and

a steam outlet from the top of said tank.

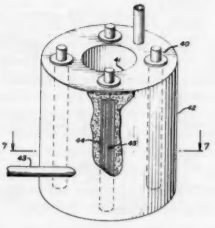
3,885,125
METHOD FOR ELECTRICALLY HEATING A HEAT TRANSFER FLUID

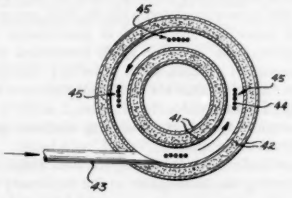
Lewis J. Palm, and Ronald B. Palm, both of Pulaski, N.Y., assignors to Fulton Boiler Works, Inc., Pulaski, N.Y.

Division of Ser. No. 77,820, Oct. 5, 1970, Pat. No. 3,747,670. This application July 23, 1973, Ser. No. 381,373

Int. Cl. H05b *1/00*; **F24h** *1/10*

U.S. Cl. 219—298 **5 Claims**





1. A method of indirectly exchanging heat with a thermal liquid having a boiling point higher than that of water along a substantially axially unobstructed elongated annular chamber that is bounded by inner and outer chamber walls that encircle a central axis, said method comprising the steps of: producing in a closed system a continuous bodily flow of said liquid continuously swirling about the central axis in a path of predetermined width and characterized by rotary and axial flow components cooperatively determining a flow that continuously fills and sweeps the entire chamber by introducing adjacent one end of the chamber a stream of said liquid along a direction that is tangent to the chamber periphery; electrically generating heat in axially elongated elements that are disposed within said annular chamber and that are sufficiently small relative to the width of said annular chamber to accommodate said continuously swirling bodily flow without turbulence, conducting heat through said elements to said liquid as it sweeps said annular chamber; and withdrawing the liquid from adjacent the other end.

3,885,126
ELECTRIC HEAT ACCUMULATOR UNIT

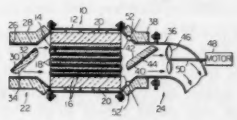
Hiroshi Sugiyama, Hiratsuka, and Kiyoshi Numagami, Yokohama, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

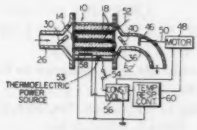
Filed June 6, 1973, Ser. No. 367,383

Claims priority, application Japan, July 13, 1972, 47-83187; June 7, 1972, 47-67686; Oct. 4, 1972, 47-115558; July 13, 1972, 47-83188

Int. Cl. H05b *1/02*; **F24h** *7/04*

U.S. Cl. 219—365 **2 Claims**





1. Heating equipment of the accumulator type installed in a motor vehicle which includes air inlet means, air outlet means, a heat accumulator having passage means for providing communication between said air inlet and outlet means, an electric heating means in heat exchange relation with said accumulator, said heat accumulator being operative to store therein heat from said heating means, valve means for regulating the area of air passage of said inlet and outlet means, and an electric blower for forcibly passing air from said air inlet means through said passage means to said air outlet means, which is characterized by:

a thermoelectric device in heat exchange with said heat accumulator for converting thermal energy in said heat accumulator into a d-c power;

a constant voltage regulator connected to said thermoelectric device and supplying said d-c power to said blower, while maintaining the voltage of said power constant; and temperature-responsive current control means responsive to the temperature of said heat accumulator, said control means being connected in the circuit between said voltage regulator and said blower for regulating the magnitude of current flowing through said blower and thereby the blower speed in inversely proportionate relation to the temperature of said heat accumulator whereby a substantially constant thermal output is maintained from the accumulator.

3,885,127
HAND HELD HAIR DRYING APPLIANCE

Henry J. Walter, Wilton, and Eugene T. Fleischhauer, Stamford, both of Conn., assignors to Clairol Incorporated, New York, N.Y.

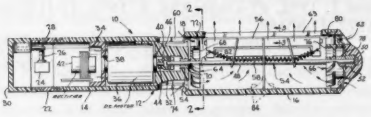
Filed Feb. 28, 1973, Ser. No. 336,562

Int. Cl. H05b *1/00*; **A45d** *20/10*; **F24h** *3/04*

U.S. Cl. 219—367 **13 Claims**

1. A hand held hair drying appliance comprising a tubular housing having first inlet means therein, second inlet means therein spaced from said first inlet means, outlet means in the peripheral wall of said housing and disposed between said first and second inlet means and a tubular handle portion formed by said housing; heating means disposed in said housing between said first and second inlet means; first and second fans arranged in said housing to force air from said first and second

inlet means toward said outlet means; said first and second fans each having blades extending radially from the axis of rotation thereof, said blades of said first fan having a pitch opposite the pitch of said blades of said second fan such that said first and second fans form oppositely directed currents of



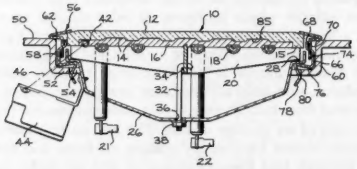
air when rotated in the same direction; and motor means disposed in said handle for driving said first and second fans whereby air is drawn into said housing through said first and second inlet means, moved past said heating means and expelled through said outlet means to provide heated air for drying hair.

3,885,128

GLASS-CERAMIC PLATE HEATING UNIT CAST-IN HEAT SPREADER

Raymond L. Dills, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed July 1, 1974, Ser. No. 484,421
Int. Cl. H05b *3/68*
U.S. Cl. 219—462 **3 Claims**



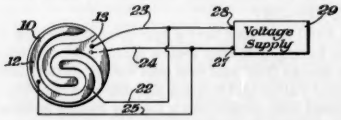
1. A surface heating unit comprising a glass-ceramic plate having recess means formed on the underside thereof, the recess means substantially covering a large area of the plate and being substantially filled with a metal casting of high thermal conductivity such as aluminum or copper that is formed in place, a metal sheathed electrical resistance heating element with a reinforcing member of open framework fastened across the underside of the heating element, the heating element and reinforcing member being partially embedded in the said metal casting, whereby the metal casting serves as both a mechanical and thermal coupling means between the heating element and the glass-ceramic plate as well as the heat spreader means across the plate.

3,885,129

POSITIVE TEMPERATURE COEFFICIENT RESISTOR HEATER

John H. Fabricius, Stamford, Vt., assignor to Sprague Electric Company, North Adams, Mass.

Filed Feb. 28, 1974, Ser. No. 446,858
Int. Cl. H05b *3/10*
U.S. Cl. 219—553 **9 Claims**



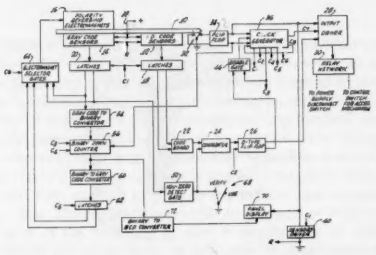
1. A PTCR heater comprising a disc of PTCR material, said disc having two opposed flat surfaces and a perimeter face, a first pair of arcuate interdigitated metal film electrodes bonded to one of said surfaces, said electrodes each having a finger-like shape, the separation between adjacent portions of said electrodes being substantially constant, an electrical connective means for connecting the alternative of said electrodes to one lead and the remained of said electrodes to another lead, said leads being capable of connection to an electrical energy source such that said adjacent electrodes are oppositively polarized and the heating electric currents in said disc flow predominantly near said one of said surfaces.

3,885,130

VALUE/USE CONTROL AND IDENTIFICATION SYSTEM FOR MAGNETIC CARDS

Eric W. Moulton, Santa Monica, and Waldo I. Rogers, Arcadia, both of Calif., assignors to Rusco Industries, Inc., Los Angeles, Calif.

Filed Sept. 4, 1973, Ser. No. 394,265
Int. Cl. G06k *7/08*; **G11b** *5/02*
U.S. Cl. 235—61.11 D **6 Claims**



1. In combination:

first and second groups of like stationary electromagnet sensors with which respective magnetized spots of a card are aligned in a stationary position of the card, wherein each spot is magnetized perpendicular to the card faces, wherein the spots associated with the first group of sensors have polarities distributed in accordance with an identification code and the spots associated with the second group of sensors have polarities distributed in accordance with a value/use code that represents a number of uses for the card;

respective stationary polarity reversing electromagnets for the value/use code spots,

the value/use code spots being aligned with respective polarity reversing electromagnets in the stationary position of the card;

first means coupled to the sensors of the the first group for developing signals representing the identification code;

second means coupled to the sensors of the second group for developing signals representing the value/use code;

third means coupled to said second signal developing means for developing signals representing a predetermined smaller number of uses for the card;

means for coupling said polarity reversing electromagnets to said third signal developing means for operating said polarity reversing electromagnets to change the polarity distribution of the associated spots so they represent the predetermined smaller number of uses for the card;

a switch operable by the card when it is placed in its stationary position;

control means to which said switch is connected to be rendered operable when the switch is operated by a card,

said control means including means for simultaneously rendering said first and second signal developing means operable;

and means for inhibiting operation of said coupling means when said first signal developing means develops signals that do not represent the identification code and for

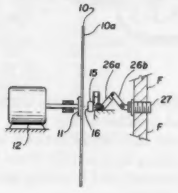
inhibiting operation of said coupling means when said second signal developing means develops signals that represent a zero value/use code.

3,885,131

AIR-BEARING DATA TRANSFER SYSTEM

John B. Franceschini, Centerport, and Leonard Meltzer, Little Neck, both of N.Y., assignors to Dynell Electronics Corporation, Melville, N.Y.

Filed Apr. 13, 1973, Ser. No. 351,084
Int. Cl. G06k *7/10*
U.S. Cl. 235—61.11 E **8 Claims**



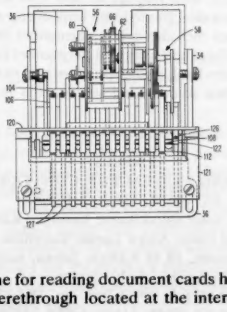
1. In an air-bearing data-transfer system, a rotary member having a data-storage face and having an inherent run-out error in rotation causing recurrent reciprocating movement in a direction perpendicular to said face with each rotation, said member being resiliently deformable in a direction perpendicular to said face, a data-transfer head having an air-bearing surface opposing the storage face and having a geometry compatible therewith to establish an air bearing therebetween, control means to move the record and data-transfer head into close proximity to establish the air bearing between the surfaces when rotary motion obtains and to establish further movement in the perpendicular direction to deform the record opposite the air bearing by an amount exceeding the run-out error, and anchoring means having a resilience less than that of the data-storage face to maintain the data-transfer head continuously in said record-deforming position, whereby a fixed predetermined spacing is established between the data-transfer head and the data-storage face.

3,885,132

DOCUMENT CARD READER

Richard William Luoma, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 30, 1973, Ser. No. 365,363
Int. Cl. G06k *7/04, 13/02;* **B41l** *45/00;* **G07f** *1/06;* **G06k** *21/04*
U.S. Cl. 235—61.11 R **6 Claims**



1. A machine for reading document cards having data indicative holes therethrough located at the intersections of rows and columns,

a frame,

a carriage slideably mounted with respect to said frame so as to have a linear movement with respect to the frame in a certain path and adapted to carry a document card so that the card moves in the direction of its said columns along with movement of the carriage,

a row of detectors extending transversely of said path each adapted to detect the holes in one of said columns of a document card carried by said carriage as the carriage moves along its said path,

spring means effective on said carriage and yielding to allow said carriage and a document card carried thereby to be moved from initial positions at one end of said path to pre-read positions at the other end of said path and applying a spring force in a direction to return the carriage and a document card carried thereby back to their initial positions from their said pre-read positions, and

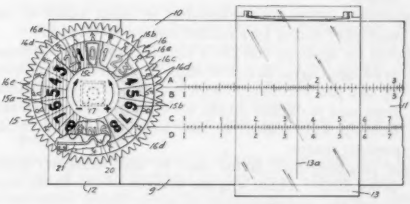
speed limiting governor mechanism acting on said carriage and against the spring force from said spring means and limiting the speed of the carriage in returning back to its initial position from its pre-read position to a predetermined speed so that the document card carried by said carriage passes across said detectors at a constant speed and each of said detectors is effective to detect the holes in successive rows after equal time intervals for dependable hole detecting action.

3,885,133

METHOD AND APPARATUS FOR CALCULATING EXPONENT CHARACTERISTICS

Rudolph Zemanek, and Elena Zemanek, both of 516 S. Orlando Way, Vancouver, Wash. 98664

Filed Feb. 7, 1974, Ser. No. 440,298
Int. Cl. G06c *19/02*
U.S. Cl. 235—64.3 **2 Claims**



1. An exponent characteristic calculator for use with slide rule computations, said calculator comprisng,

a. a first stationary disc having numbered scale divisions thereon and a window therein forming a fixed reference point,

b. a second disc mounted for rotation about its center point as an axis in underlying concentric relation to the first stationary disc and carrying a second scale having similar numbered divisions to said first scale positioned for selective registration of the scale numbers with the window of said first overlying disc,

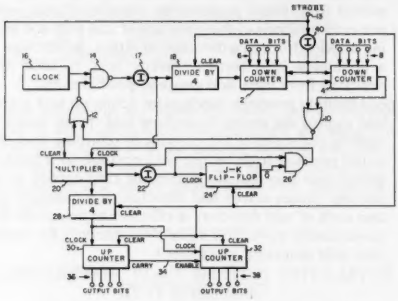
said second disc having outer peripheral portion surrounding said first disc and of larger diameter than the first disc and having a third scale including reference indicia carried by said outer peripheral disc portion with the indicia thereof respectively registered with the numbers on said second scale and selectively registrable with the numbers on the first scale,

whereby the increment of rotation of the second disc will be indicated by the specific scale indicium on said third scale in registration with each specific exponent number identified on the first scale and the calculated exponent number will thus be indicated by the number on the second scale in registration with the window in the first disc.

3,885,134
BINARY-TO-PERCENT CONVERTER

William P. Bergin, Churchville, and Charles C. Farmer, North Wales, both of Pa., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed May 22, 1973, Ser. No. 362,768
Int. Cl. G06f *7/38*
U.S. Cl. 235—92 DM **6 Claims**



1. A converter circuit comprising:

a counter means for storing an input data signal and responsive to a clock signal for counting from said data signal to a predetermined count,

clock signal generating means,

gate means connected between said clock signal generating means and said counter means to apply clock signals from said clock signal generating means to said counter means until said predetermined count is reached in said counter means,

multiplier means for multiplying an input signal to said multiplier means by a predetermined factor, and

means for applying said clock signals from said gate means as an input signal to said multiplier means to be multiplied by said predetermined factor to produce an output signal from said multiplier means having a predetermined relationship with respect to said input data signal to said counter means,

said predetermined factor used by said multiplier means being $50/2^{n-1}$ where n is the number of bits in the input signal and said multiplier means including pulse adding means for adding one pulse for every other multiplication cycle of said multiplier means and averaging means for averaging four cycles of said multiplier means to produce an average multipling factor of $101/2^n$.

3,885,135
APPARATUS FOR COUNTING CAN ENDS

Bruce Leslie Elmer, St. Peters, Mo., assignor to Llanco Container Corporation, Bridgeton, Mo.

Filed Jan. 15, 1974, Ser. No. 442,750
Int. Cl. G06m *9/00*
U.S. Cl. 235—98 R **6 Claims**

1. An apparatus for segregating nested articles into discrete stacks, each stack containing an equal number of articles, comprising:

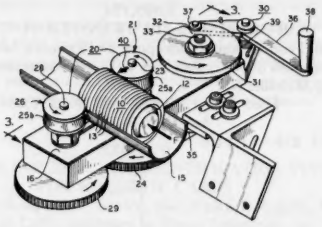
a trough for carrying a plurality of nested articles in edgewise alignment;

first and second rotatable counting gears secured to first and second shafts, respectively, said counting gears being aligned on opposite sides of said trough and having a plurality of teeth adapted to engage successive edges of said nested articles;

a first synchronizing gear secured to said first shaft;

a second synchronizing gear secured to said second shaft and mechanically cooperating with said first synchronizing gear for maintaining said first and second counting gears in synchronous rotation as said nested articles move along said trough;

a rotatable cam mechanically coupled to said first synchronizing gear; and

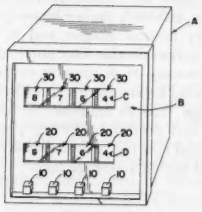


cam stop means for simultaneously stopping the rotation of said cam, said synchronizing gears, and said counting gears when said number of articles have been counted, thereby preventing said articles from being moved along said trough between said counting gears.

3,885,136
RESET TIMER/COUNTER UNIT

Frederick E. Erickson, Silvis, Ill., assignor to Gulf and Western Industries, Inc., New York, N.Y.

Filed Feb. 25, 1974, Ser. No. 445,137
Int. Cl. G06c *15/42;* **G06f** *15/18*
U.S. Cl. 235—144 ME **28 Claims**



24. In a reset wheel assembly for a reset counter, said wheel assembly including first and second subwheels journalled about a shaft; said first subwheel including means for holding said first subwheel in a selected angular position with respect to said shaft; said second subwheel including drive means for driving said second subwheel with respect to said first subwheel; and biasing means for rotating said second subwheel to a selected position with respect to said first subwheel when said drive means is deactivated, the improvement comprising: said biasing means includes a first permanent magnet carried by said first subwheel and a second permanent magnet carried by said second subwheel, said permanent magnets being mutually balanced when said second subwheel is in said selected position.

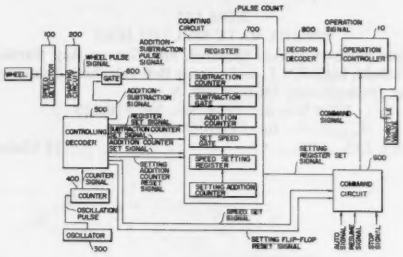
3,885,137
METHOD AND SYSTEM FOR CONSTANT-SPEED RUNNING OF VEHICLES

Junichiro Ooya; Naoji Sakakibara; Yasuhiro Kawabata; Hideo Nawa; Takashi Hida; Akira Tarao; Korehiko Tsukuba, and Kazutaka Kuwana, all of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed May 8, 1972, Ser. No. 184,111
Int. Cl. B60k *31/00;* **G05d** *13/00*
U.S. Cl. 235—150.2 **10 Claims**

2. A system for constantly adjusting the speed of a motor vehicle to a set speed, comprising means for sensing the rota-

tional state of the wheels of the motor vehicle, a shaping circuit for translating an output signal from said sensing means into pulses of desired characteristics, a control circuit for producing control signals from clock pulses of a predetermined frequency, manually operable means for setting a speed at which the motor vehicle is desired to run constantly, a counting circuit for counting the output pulses from said shaping circuit as dictated by said control signals to obtain a pulse number in binary notation which represents a set speed

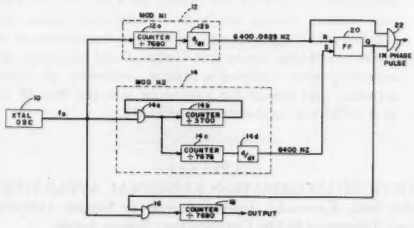


of the motor vehicle and pulse numbers representing its actual speed at specified instants and for further counting a pulse number in binary notation substantially representing the sum of a difference between the set speed and the actual speed of the motor vehicle and a rate of change in its actual speed, a decision circuit for deciding an operation required on the basis of the final pulse number obtained in said counting circuit, and operation controller means for adjusting the speed of the motor vehicle according to an output signal from said decision circuit.

3,885,138
ULTRA LINEAR FREQUENCY SWEEP GENERATOR

Norman F. Bates, Dana Point, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 18, 1974, Ser. No. 489,683
Int. Cl. H03b *23/00*
U.S. Cl. 235—150.53 **17 Claims**

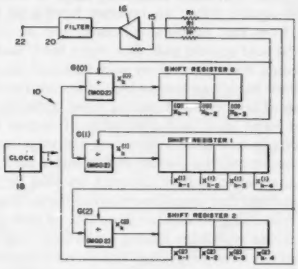


1. A sweep frequency generator comprising:
oscillator means for producing clock pulses;
first means responsive to said clock pulses for producing a first output signal with a first repetition rate;
second means responsive to said clock pulses for producing a second output signal with a second repetition rate;
third means responsive to the output signals of said first and second means for producing a third output signal representing the phase difference between said first and second output signals; and
fourth means responsive to the output signal of said third means and to said clock pulses for producing a fourth output signal having a repetition rate proportional to the output signal of said third means.

3,885,139
WIDEBAND DIGITAL PSEUDO-GAUSSIAN NOISE GENERATOR

William J. Hurd, LaCanada, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed July 27, 1973, Ser. No. 383,386
Int. Cl. G06f *7/00*
U.S. Cl. 235—152 **24 Claims**

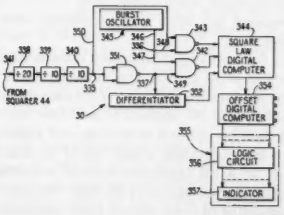


1. In a digital noise generator, an arrangement comprising:
a multiregister network including N binary shift registers, N being not less than 2, each shift register including not less than one stage, the total number of stages of said N shift registers being equal to *n*, where N and *n* are integers;
input means for providing an input to each register which is the exclusive-OR function of the outputs of at least two stages of said registers, at least one of which is from a different register, with said input means being connected to said registers, so that the last stage of each of said registers is responded to by the input means providing an input to at least one register, and the characteristic polynomial of said multiregister network is primitive whereby the sequence of states of each stage of any of said registers is a maximal length sequence period of 2^n-1, regardless of the register's number of stages;
clock means for clocking said shift registers at a preselected frequency; and
output means coupled to N of said stages, one stage from each of said N registers for providing a pseudo-gaussian noise output as a function of the outputs of said N stages.

3,885,140
DENSITOMETER

Gerald Lance Schlatter, Boulder, Colo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 423,409, Dec. 10, 1973. This application Aug. 12, 1974, Ser. No. 496,341
Int. Cl. G06f *7/38*
U.S. Cl. 235—152 **1 Claim**



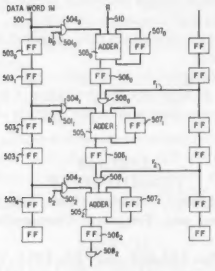
1. Apparatus for producing serial groups of serial pulses wherein the number of pulses in a group is directly propor-

tional to the square of the reciprocal of the fundamental frequency of a periodic wave, said apparatus comprising: a terminal junction; first means having an output lead, said first means supplying a square wave on said output lead thereof, said square wave having a variable pulse repetition frequency and a mark-to-space ratio of unity, said first means output lead being connected to said terminal junction; first and second NAND gates, each of said NAND gates having first and second input leads and an output lead; a burst oscillator having a constant pulse repetition frequency large in comparison to that of said square wave; an inverter having an input lead connected from said terminal junction, and an output lead connected to said second gate first input lead, said first gate first lead being connected from said terminal junction, said burst oscillator having an output lead connected to the second lead of each of said first and second gates; a divider having at least a first input lead, and a plurality of output leads, said divider acting as a counter and having a storage register with a constant count entered therein during alternate half periods of said square wave, pulses counted by said divider being supplied over said first input lead thereof thereto, said divider first input lead being connected from one of said gate output leads; and a rate multiplier having a plurality of setting input leads connected from respective bits in said divider register, said rate multiplier having a serial pulse input lead connected from the other of said gate output leads and a serial pulse output lead, said rate multiplier producing serial groups of serial pulses, the number of pulses in a group being directly proportional to the square of the reciprocal of the pulse repetition frequency of said square wave.

3,885,141
MODULAR PIPELINE MULTIPLIER TO GENERATE A ROUNDED PRODUCT

Robert Bruce Kieburtz, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 6, 1974, Ser. No. 440,067
Int. Cl. G06f *7/54*
U.S. Cl. 235—164 **7 Claims**



1. A pipeline digital multiplier circuit for forming the rounded product of an *n*-bit data word and an *m*-bit coefficient word comprising

a. *m* identical stages, each comprising

i. first, second and third input terminals and an output terminal,

ii. means for applying a uniquely associated bit of said coefficient word to said first input terminal,

iii. means for forming during the *i*th time interval the bit product of said bit applied at said first input terminal with a data bit applied at said second input terminal,

iv. means for generating a sum signal by adding said bit product to a bit representative of a partial product generated during the $(i-1)$th time interval and a bit representative of carry signals from previous additions,

v. means for selectively inhibiting said sum signal to eliminate those sum signals which contribute only to one of the bits of the truncated portion of the product of said data word and said coefficient word,

vi. means for applying said selectively inhibited sum signal to said output terminal,

b. means for connecting the output terminal of each stage but the last to the third input terminal of the next succeeding stage,

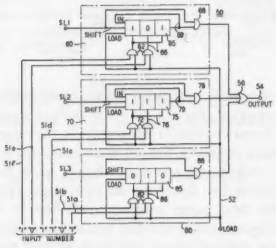
c. means for sequentially applying said *n*-bit data word to the second input terminal of the first of said stages, and

d. means for applying a logic 1 signal to said means for generating a sum signal in said first stage.

3,885,142
BINARY RATE MULTIPLIERS

William Herbert Ninke, Holmdel, and George Ray Ritchie, Freehold, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 15, 1974, Ser. No. 470,220
Int. Cl. G06f *7/52*
U.S. Cl. 235—164 **19 Claims**



1. In combination,

circuit means operative in response to a selected input number for generating a hierarchy of individual binary rate unit vectors substantially concurrently, each of said unit vectors being generated in response to a respective associated bit group of said input number, the position of each of said unit vectors in said hierarchy corresponding to the positional significance in said input number of the bit group associated therewith, and

means for successively repeating individual unit vectors of said hierarchy and for interposing each bit of each of said unit vectors, except the highest order unit vector, substantially halfway between successive repetitions of the entire next higher order unit vector of said hierarchy, said repeating and interposing means including an output terminal and means for extending selected bits of said unit vectors to said output terminal.

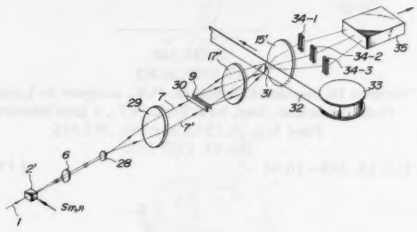
3,885,143
OPTICAL INFORMATION RETRIEVAL APPARATUS

Akira Ishii, Kawasaki, Japan, assignor to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Nov. 15, 1973, Ser. No. 416,306
Claims priority, application Japan, Nov. 17, 1972, 47-114748
Int. Cl. G06g *9/00;* **G11c** *11/42*
U.S. Cl. 235—181 **6 Claims**

1. An optical information retrieval apparatus comprising a first optical system for checking character coincidence matching and a second optical system for reading out characters detected by coincidence checking at the first optical system so that coincidence matching between an interrogation signal and a hologram memory information character to be retrieved, both represented in the form of an M-out-of-N code, is checked by utilizing the correlation detection function of a hologram, said character coincidence checking optical system comprising in combination:

a. a laser light source for generating a laser light beam;
b. modulator means for coding the laser light beam generated by said laser light source into an M-out-of-N coded interrogation beam pattern including M light beams with different frequencies;
c. optical means responsive to the coded interrogation beam pattern produced by said modulator means for projecting the coded interrogation beam pattern onto hologram memory arrays storing information to be retrieved in the form of the M-out-of-N code used for coding the laser light beam generated by said laser light source;

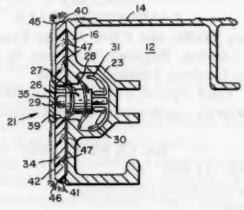


d. photo-detector array means for producing an electrical output corresponding to the light output resulting from the projection of the coded interrogation beam patterns onto hologram memory arrays; and
e. electric circuit means responsive to the electrical output produced by said photo-detector array means for detecting an A.C. component in the electrical output produced by said photo-detector means, whereby the presence of coincidence matching between the code interrogation signal and the coded hologram memory information may be detected.

3,885,144
AISLE LIGHT

Robert E. Lewis, and Robert S. Walworth, both of Champaign, Ill., assignors to American Seating Company, Grand Rapids, Mich.

Filed Feb. 19, 1974, Ser. No. 443,420
Int. Cl. F21v *33/00*
U.S. Cl. 240—2 R **5 Claims**

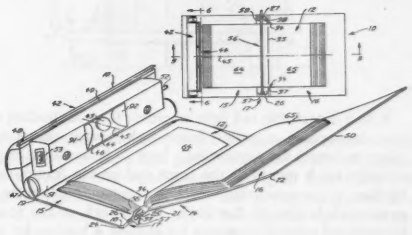


1. An aisle light for providing guidance illumination for a step having a tread and a riser comprising: a light-piping shatterproof plastic faceplate panel extending substantially the entire height of said riser and having an upper edge immediately adjacent and parallel to the upper edge of said riser, the forward part of said panel edge being beveled, the outer surface of said faceplate being stippled; means for securing said faceplate to said riser; a source of light carried by said riser and radiating light into the body of said faceplate panel whereby said light travels through said panel and illuminates said upper edge thereof, said light source including a low-voltage, shock-resistant, replaceable bulb; and a metal cover strip having a height less than the height of said panel and extending across said panel and located directly in front of said bulb to shield the filament of said bulb from direct vision.

3,885,145
COMBINATION BOOK ENCLOSURE AND READING LAMP

Norman Dudley Wise, 1260 Chartwell Dr., West Vancouver, British Columbia, Canada

Filed Feb. 5, 1974, Ser. No. 440,064
Int. Cl. F21 *27/00*
U.S. Cl. 240—6.4 B **12 Claims**



1. A combination book enclosure and reading lamp adapted to retain a book therein to provide protection for the book when not in use, and to provide illumination for reading the book, the combination including:
a. a cover assembly to form the enclosure, the assembly being characterized by:
first and second cover portions having respective inner and outer edges;
a spine portion having spaced parallel first and second edges and spaced ends, space between the edges of the spine portion defining width of the spine portion, the first edge of the spine portion being adjacent the inner edge of the first cover portion so as to be essentially integral therewith, the spine portion being inclined at a fixed obtuse angle to the first cover portion;
a hinge portion provided adjacent the second edge of the spine portion to hinge the second cover portion to the spine portion, the hinge having a hinge axis;
a link attachment means provided adjacent each end of the spine portion, the attachment means being spaced sufficiently to accept a spine of a book therebetween;
b. a lamp housing provided adjacent the outer edges of the cover portions, the housing being characterized by:
a lower edge of the housing adjacent the outer edge of the first cover portion to hold the housing rigidly relative to the first cover portion;
an upper edge of the housing spaced upwards from the lower edge of the housing;
cooperating releaseable latch means adjacent the upper edge of the housing to accept and retain the outer edge of the second cover portion when the second cover portion is closed for protecting the book;
an elongated reflector fitted within the housing and positioned facing the spine portion;
an electrically powered lamp fitted within the reflector and positioned therein to direct light on to the pages for reading;
c. a flexible link extending under tension between the link attachment means so as to be generally parallel to the hinge axis, the link passing between the pages of the book adjacent the spine of the book so that the spine of the book is urged against the spine portion of the assembly so as to retain the book firmly within the enclosure.

3,885,146

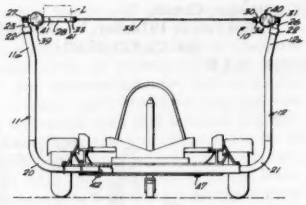
DETACHABLE TAIL LIGHT ASSEMBLY FOR BOAT TRAILERS

William P. Whitley, Jr., 4525 E. 10th Ln., Hialeah, Fla. 33013

Filed Feb. 22, 1974, Ser. No. 444,808

Int. Cl. B60g *1/26*

U.S. Cl. 240—7.1 R **7 Claims**



1. In a detachable tail light assembly for boat trailers of the type comprising a trailer framework having chock means along its length for supporting a boat to be trailered thereon, a trailer hitch means at the front end of the framework for hitching to a transporting vehicle, an upstanding tubular guide post at each side of the trailer framework at the rear end thereof and serving as means for guiding a boat to be loaded for trailering, and an electrical energization cable running from the front to the rear of the trailer for interconnection with the electrical circuitry of a vehicle to which the trailer is attached for pulling, the combination comprising; a pair of electrical vehicle signal light units, means for removably securing one side of one of said signal light units to the upper end of one of said upstanding guide posts, means for removably securing one side of the other of said signal light units to the upper end of the other of said upstanding guide posts, and elastic means interconnecting the other sides of said signal light units for yieldingly urging said signal light units towards one another, said signal light units each comprising an electrical energization cable terminating in an electrical connector member adapted for electrical interconnection with the electrical energization cable of the trailer.

3,885,147

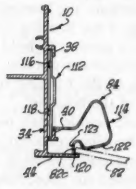
MULTIPLE LIGHTING FIXTURE DISPLAY SYSTEM

Julian Chacon, San Gabriel, Calif., assignor to Lightcraft of California, Los Angeles, Calif.

Filed Jan. 17, 1974, Ser. No. 434,265

Int. Cl. F21s ; F21v *21/10;* **B42f** *13/00*

U.S. Cl. 240—9 R **4 Claims**



1. A light fixture display installation comprising:

an elongated channel with a base wall and a pair of side walls extending therefrom, and having a plurality of electrical outlets spaced along its length, each of said side walls having a pair of mounting flanges extending towards each other, and the end of each side wall having an outturned flange;

a plurality of support brackets for supporting the channel to a supporting wall;

a plurality of decorative wall panels; and

a plurality of panel clips for holding the edges of a wall panel securely in place immediately behind an outturned flange of the channel, each clip being formed of a sheet of resilient material with a base portion lying substantially against one of said channel side walls and extending between the mounting flanges thereof, and a projecting portion extending in a reverse curve to an end thereof which is resiliently biased against an outturned flange, said projecting portion having an intermediate part for pressing against the rear surface of the decorative wall panel, said intermediate part lying slightly behind the outturned flange to press the panel against the out-turned flange.

3,885,148

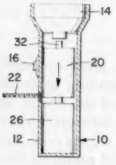
FLASHLIGHT

Nicholas Di Benedetto, Brooklyn, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Aug. 3, 1973, Ser. No. 385,455

Int. Cl. F21l *7/00*

U.S. Cl. 240—10.66 **5 Claims**



1. A flashlight employing at least one cylindrical battery of the dry cell type, said flashlight comprising a head having a socket in which a bulb is mounted; a cylindrically shaped case capable of holding at least two batteries, said case having a transverse slot partially cut through a midpoint of said case at a point approximately adjacent to a rear of a first battery in contact with said bulb; a plate pivotally mounted on said case and insertable through said transverse slot; said plate having a conductive surface facing the head and a non-conducting rear surface facing a second battery, and a switch mounted on said case and conductively connected to said plate and said socket.

3,885,149

LAMP PINCH SEALS

Kenneth Roy Wolfe, and Clive Arthur Evander Underwood, both of London, England, assignors to Thorn Electrical Industries Limited, London, England

Filed Apr. 4, 1973, Ser. No. 347,825

Claims priority, application United Kingdom, Apr. 14, 1972, 17392/72

Int. Cl. F21m *3/00*

U.S. Cl. 240—41 BM **9 Claims**

1. An electric lamp comprising:

an envelope,

support means within said envelope,

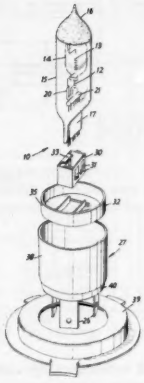
a filament carried by said support means,

said support means including means for electrically connecting said filament to an external supply,

said connecting means comprising: at least two inner conductors, two externally-accessible outer conductors and a separate conductive foil joining each of said inner conductors to an outer conductor,

said envelope having at least one pinch seal for sealing the envelope to said foils so that each of said foils is embedded in a pinch seal and equal thicknesses of envelope material are in contact with the opposite surfaces of each of said foils,

a portion of said pinch seal within at least one of which said foils is embedded being displaced laterally with respect to the remainder of said seal, and



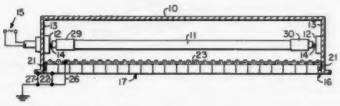
each of said inner conductors leading into the interior of said envelope from its associated foil in a direction parallel to a central longitudinal axis through said lamp, said foils being laterally displaced from said axis.

3,885,150

SHIELDED LUMINAIRE

John Nash Ott, Sarasota, Fla., assignor to John Ott Laboratories, Sarasota, Fla.

Filed Dec. 3, 1973, Ser. No. 421,253
Int. Cl. F21v *11/06*
U.S. Cl. 240—46.39 **5 Claims**



1. A shielded luminaire comprising:

a housing formed of conductive material having a light-emitting opening therein,

a gas discharge type lamp mounted within said housing so as to project light through said opening,

a light shielding louver assembly extending over said opening, said assembly comprising a plurality of crossed fins formed of conductive material which form cells through which light from said lamp passes,

a mesh screen formed of crossed conductive strands extending across said opening between said lamp and said louver assembly, and

connecting means electrically connecting to ground potential said housing, louver assembly and screen,

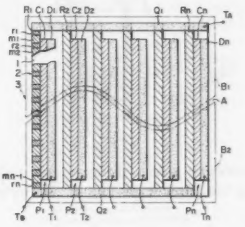
the area of the screen mesh being sufficient to permit passage of light therethrough but smaller than the cell area of the louver assembly whereby RF radiation from said lamp is attenuated over an extended frequency range by action of the grounded screen and louver assembly while permitting passage of light from said lamp through the screen mesh and louver cells into the area illuminated by said lamp.

3,885,151

PHOTOCONDUCTIVE WAVEFORM MEMORY

Tadao Tokushima, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Nov. 5, 1973, Ser. No. 412,799
Claims priority, application Japan, Nov. 9, 1972, 47-128464
Int. Cl. H01j *39/12*
U.S. Cl. 250—211 R **5 Claims**



1. In a waveform memory which comprises, in combination;

a. means for forming a light pattern representative of a memorized waveform, said light pattern having an extent in a first direction representative of time and having an extent in a second direction representative of the amplitude of the memorized waveform at each value of time represented along said first direction; and

b. a photoelectric converter comprising a substrate for receiving the image of the waveform on a surface of the substrate and a plurality of elongated photoelectric potentiometers arranged in parrallel on the surface of the substrate and extending in said second direction, whereby an electric signal developed by each of said photoelectric potentiometers corresponds to a value of the waveform at a discrete point along the first direction representative of time,

the improvement wherein each of said photoelectric potentiometers comprises:

1. an elongated resistance element comprising a plurality of resistive pieces connected in series, and a plurality of electrically conductive layers interposed alternately therebetween;

2. an elongated electrically conductive element disposed in parallel with said elongated resistance element; and

3. a strip of photoconductive substance interposed between said resistance element and said conductive element and continuously contacting said resistance and said conductive elements along their respective lengths.

3,885,152

METHOD OF AND APPARATUS FOR DETECTING LIGHT AND CONTROLLING JALOUSIES OR THE LIKE

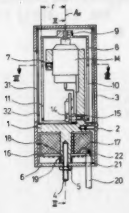
Leopold Anetseder, Sr., and Leopold Anetseder, Jr., both of Munich, Germany, assignors to Sun-Sor GmbH, Augsburg, Germany

Filed Sept. 24, 1973, Ser. No. 400,057
Claims priority, application Germany, June 1, 1973, 2327837
Int. Cl. H01j *3/14*
U.S. Cl. 250—235 **12 Claims**

1. The combination with a load comprising a motor and a sun shield of the jalousie, window blind, awning and like type driven by said motor, of a sunlight detector for controlling said load and comprising:

sensing means having a photosensitive surface for emitting an electrical output on irradiation of said surface by light; a housing surrounding said surface and having an annular displaceable wall formed parallel to said surface with a generally vertically elongated slit-like window constituting the only light entrance into said housing;

means for angularly displacing said wall and thereby displacing said slit transversely to itself about an upright axis and at a constant distance from said surface through an angle of at least 150°; and



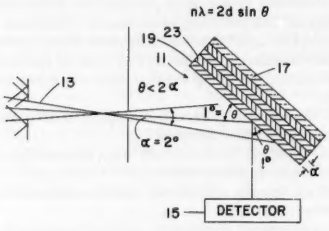
means connecting said sensing means and said load for operating said load according to said output.

3,885,153

MULTI-LAYER MONOCHROMATOR

Benno P. Schoenborn, Calverton, N.Y., and Donald L. D. Caspar, Brookline, Mass., assignors to The United States Energy Research and Development Administration, Washington, D.C.

Filed June 20, 1974, Ser. No. 481,421
Int. Cl. G01t *1/36*
U.S. Cl. 250—251 **10 Claims**



1. A monochromator for efficiently selecting a narrow band of neutron wavelengths from an input beam having a Maxwellian wavelength distribution of neutrons comprising:

a. a flat substrate;

b. a plurality of parallel, flat, uniform, selectively tailored thickness, amorphous germanium layers uniformly deposited over the entire surface of said substrate; and

c. a plurality of amorphous layers that alternate periodically with said germanium layers, are interposed therebetween to form bilayers and are parallel therewith selected from the group consisting of tantulum and mangenese having a selectively tailored thickness.

3,885,154

METHOD AND APPARATUS FOR REDUCING BACKGROUND IN INELASTIC GAMMA RAY LOGGING SYSTEMS

Richard B. Culver, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

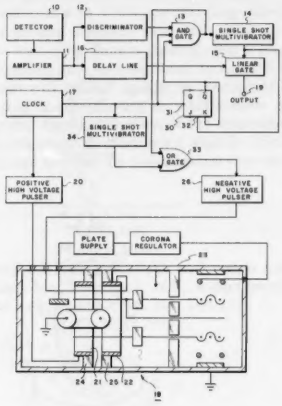
Filed Oct. 26, 1973, Ser. No. 410,071
Int. Cl. G01t *1/30*
U.S. Cl. 250—267 **3 Claims**

1. A method for providing a radioactivity log of a formation surrounding a borehole, comprising:

irradiating said formation with at least one discrete burst of fast neutrons during a variable time period;

detecting radiation occasioned in said formation by said fast neutrons; and

limiting the number of fast neutrons generated in said at



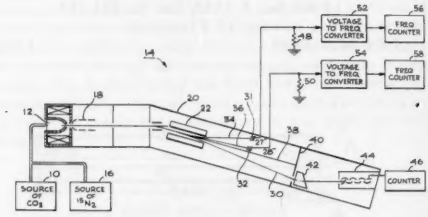
least one burst by shortening said time period as a function of said detected radiation.

3,885,155

MASS SPECTROMETRIC DETERMINATION OF CARBON 14

Michael Anbar, Palo Alto, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Nov. 1, 1973, Ser. No. 411,801
Int. Cl. H01j *39/28*
U.S. Cl. 250—283 **4 Claims**



1. A method of measuring carbon **14** content in a sample comprising

converting carbon in said sample to CO_2,

mixing said CO_2 with $^{15}N_2$,

converting said mixture of CO^2 and $^{15}N_2$ into CN^- ions having different masses including mass **29**,

separating said mass **29** CN^- ions from the ions having other masses, and

counting the number of mass **29** ions which have been separated from which count the concentration of carbon **14** in said sample can be determined.

3,885,156

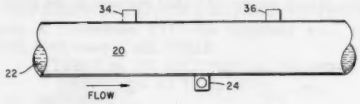
NEUTRONIC FLOW METER

Alvin Radkowsky, Tel Aviv, Israel, assignor to The United States of America as represented by the Energy Research and Development Administration, Washington, D.C.

Filed May 23, 1974, Ser. No. 472,931
Int. Cl. G01t *1/16*
U.S. Cl. 250—303 **7 Claims**

1. An apparatus for measuring the mass flow rate of a fluid comprising a neutron source embedded within a moderator,

said moderator being in contact with a cryogenic cooler disposed to lower the temperature of said moderator to at least 4° Kelvin, and a pair of neutron detectors spaced up stream



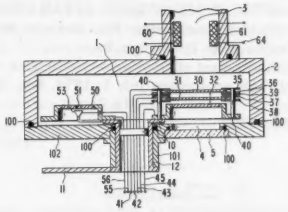
and down stream of the neutron source, whereby a neutron difference reading between the detectors can be utilized for determining the flow rate of a fluid.

3,885,157

ELECTRON BEAM IMAGE PROCESSING DEVICE

Klaus Heinemann, Sunnyvale, Calif., assignor to Electron Optical Research and Technology Corporation, Fremont, Calif.

Filed Dec. 12, 1973, Ser. No. 424,159
Int. Cl. G01n *21/26, 23/12*
U.S. Cl. 250—311 **18 Claims**



1. Device for analysis of corpuscular rays, such as an electron beam after the beam has left the specimen stage of a transmission electron microscope, the device comprising:

a chamber having walls enclosing a space relatively devoid of matter, a portion of the chamber adapted to admit incoming corpuscular rays, such as an electron beam;

a plurality of spaced electron-beam processing units located within the chamber, the units comprising:

a first processing unit comprising:

a phosphor screen having a relatively small hole extending through a portion thereof; and,

a single channel electron multiplier aligned with the hole, with the screen located in front of the multiplier relative to an incoming electron beam;

a second processing unit comprising:

a plurality of spaced multichannel electron multipliers; and

a phosphor screen, with the multipliers located in front of the screen relative to an incoming electron beam;

a third processing unit comprising a phosphor screen:

means for selecting a processing unit and aligning said unit with an electron beam in the chamber; and

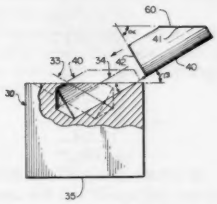
means for selectively applying voltage potentials to a selected processing unit.

3,885,158

SPECIMEN BLOCK AND SPECIMEN BLOCK HOLDER

Richard Edward Flutie, Melbourne Beach, and Richard William Belcher, Indialantic, both of Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Oct. 23, 1973, Ser. No. 408,836
Int. Cl. H01j *37/20*
U.S. Cl. 250—440 **11 Claims**



1. A specimen block holder and a specimen block for holding a specimen in a selected plane for use in optical microscopes and for use in specimen coating operations comprising:

a block holder having a first planar base surface for resting said holder on a supporting surface;

at least one cavity extending downward into a portion of said holder, said cavity having a linear axis which forms a first acute angle with respect to said first planar base surface and;

a cylindrical specimen block having a second planar base surface, and a third planar specimen mounting surface inclined at a second acute angle with respect to said second planar base surface to form said selected plane said cylindrical block extending into said cavity and resting therein in such a manner that said third planar specimen mounting surface is substantially parallel to said first planar base surface.

3,885,159

MEASURING ELEMENT FOR THE DETECTION AND DETERMINATION OF RADIATION DOSES OF GAMMA RADIATION AND NEUTRONS

Walter Jahn, Ingelheim, and Ernst Piesch, Leopoldshafen, both of Germany, assignors to Gesellschaft fur Kernforschung mbH, Karlsruhe and Jenaer Glaswerk Schott & Gen., Mainz, both of, Germany

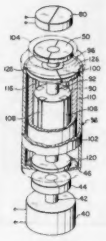
Filed Feb. 27, 1973, Ser. No. 336,217
Claims priority, application Germany, June 20, 1972, 2229662
Int. Cl. G01t *1/06*
U.S. Cl. 250—472 **7 Claims**

1. Measuring element for proving and determining radiation does of gamma radiation and neutrons,, the proof and determination of the gamma radiation being proportional to the gamma radiation dose and the proof of the neutrons being proportional to the effective neutron dose, it being additionally possible to determine the curve of the neutron sepctrum, characterized in that the measuring element is a body of a photoluminescent material which stores gamma radiation by changing its chemical and physical properties and which emits a measurable luminescent light when excited by a read-out radiation, the photoluminescent material containing homogeneous particles of arsenic and phosphorus embedded therein which particles can be excited by neutron radiation and then produce beta particles, or protons, or beta particles and protons which generate a measurable Cerenkov radiation in the photoluminescent material.

3,885,160
PULSED NEUTRON SOURCE WELL LOGGING SYSTEM

Mat E. Dillingham, Fort Worth, Tex., assignor to The Western Company of North America, Fort Worth, Tex.

Continuation of Ser. No. 194,423, Nov. 1, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,539
Int. Cl. G01t *3/00*
U.S. Cl. 250—499 **10 Claims**



1. A pulsed radiation system comprising a sealed chamber, means defining a plurality of elongated source areas within said chamber, each of said source areas comprising a material which continuously emits charged particles, means defining a plurality of elongated target areas within said chamber, each of said target areas comprising a material which emits primary radiation when bombarded with charged particles emitted by one of said source material areas, means for positioning said target areas so that the exposed surfaces thereof lie in the surface of a first cylinder, means for positioning said source areas so that the surfaces thereof lie in the surface of a second cylinder which has the same axis as the first cylinder, control means for periodically and simultaneously exposing said target areas to charged particles emitted from said source areas, thereby periodically to develop bursts of primary radiation which have an intensity proportional to the length of said target areas which is exposed to said charged particles, said control means including a rotatable shaft within said sealed chamber, a permanent magnet secured to said shaft, electromagnetic locking means adapted to be positioned outside said chamber and arranged when energized to control the position of said permanent magnet, and means independent of said control means for energizing said electromagnetic locking means, said electromagnetic means being oriented relative to said chamber so that when said locking means is energized said permanent magnet is moved thereby to a position in which said source and target areas are positioned in face-to-face relationship.

3,885,161
STRAND DETECTION ARRANGEMENT

John W. Tarbox, Oceanside; Walter E. Hinds, Beverly Hills; Rodolfo Castro, La Palma, and Raymond C. Bell, Fallbrook, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

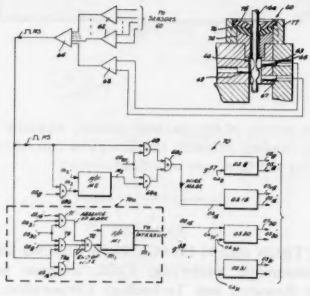
Division of Ser. No. 103,233, Dec. 31, 1970, Pat. No. 3,699,630. This application Oct. 17, 1972, Ser. No. 298,189
Int. Cl. G01b *7/12*
U.S. Cl. 250—571 **11 Claims**

5. A strand material detection arrangement comprising:

means for passing said strand material, said strand material including portions deformed in a predetermined manner marking predetermined sections along the length of the strand;

a triangular detection area for axially passing a length of strand material for scanning the profile thereof, said area being located between oppositely disposed detection elements including a source of light disposed on one side and a plurality of photodetectors disposed opposite thereto in opposing relation thereto to receive light passing around a portion of the strand material passing through the area, a plurality of said photodetectors being disposed along a line parallel to the axis of the portion of strand material in the area;

said plurality of said photodetectors disposed along a line and being spaced to received light around adjacent segments of said portion of strand material in the area;

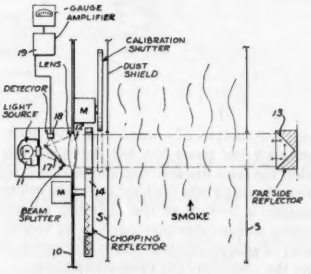


differential means coupled to said spaced photodetectors to be responsive to detected different levels of received light by said spaced photodetectors to produce an output signal indicating a change in profile of the portion of strand material located in said area.

3,885,162
OPTICAL MEASURING APPARATUS

Lloyd M. Geertz, Monroeville, Pa., assignor to Contraves-Goerz Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 411,420, Oct. 31, 1973, abandoned. This application July 1, 1974, Ser. No. 484,798
Int. Cl. G01n *21/12*
U.S. Cl. 250—573 **12 Claims**



1. In a measuring apparatus for measuring smoke density and the like, the combination comprising

a stack or duct;

a light source for emitting a beam of radiant energy through a portion of the stack;

first retro-reflector means in the path of said beam for redirecting said beam after it passes through the stack;

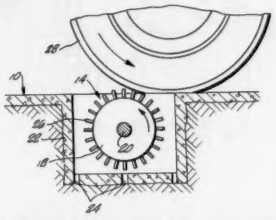
chopping means in the stack movable periodically into the path of the beam for interrupting the passage of the beam to the first reflector means;

second retro-reflector means on the chopping means movable in the path of the beam when the beam is interrupted by said chopping means;

light sensitive means externally of the stack; and

means for directing the light reflected by said first reflector means and said second reflector means to said light sensitive means.

3,885,163
EXPRESSWAY POWER GENERATING SYSTEM
Charles E. Toberman, 1717 No. Highland Ave., P.O. Box 3268, Hollywood, Calif. 90028
Filed Aug. 28, 1973, Ser. No. 392,269
Int. Cl. H02p *9/04*
U.S. Cl. 290—1 **1 Claim**

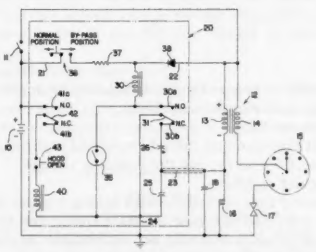


1. An electric power generating system of a type adapted for use in conjunction with a motor vehicle expressway upon which there are from time to time a plurality of moving vehicles, the system comprising:

an expressway surface, motion converting means mounted beneath said expressway surface for converting the motion of the vehicles thereon into rotational motion, said converting means comprising one or more rollers mounted perpendicular to the direction of motion of said vehicles, friction means mounted upon said rollers, said friction means extending into the path of motion of said vehicles; and

generator means coupled to said rollers for producing an electrical power outlet in response to rotational motion of said rollers.

3,885,164
ANTI-THEFT SYSTEM FOR AUTOMOTIVE VEHICLES
Gary W. Vest, 4480 Broadview Rd., Cleveland, Ohio 44109
Filed June 24, 1974, Ser. No. 482,750
Int. Cl. B60r *25/00*
U.S. Cl. 307—10 AT **8 Claims**



1. In an ignition circuit including an ignition key switch, a distributor having a set of contacts, a plurality of spark plugs operatively connected to said distributor, a voltage supply source and at least one electrical component operatively connected between said voltage supply source and said distributor for causing a sparking voltage for said spark plugs sufficient to cause and maintain engine firing, a theft prevention device comprising:

an impedance component,

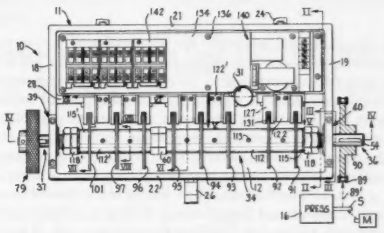
a relay adapted when de-energized by said voltage supply source to switch said impedance component into operating condition in said ignition circuit to limit the level of any transient surge of sparking voltage developed across said ignition circuit electrical component sufficiently to prevent said spark plugs from maintaining engine firing

magnetic proximity switch means adapted when activated to energize said relay coil,

separate magnetic means adapted to be carried by a vehicle operator for activating said proximity switch when placed in the vicinity thereof,

holding circuit means operatively connected to said relay for holding said relay energized after said proximity switch closes whereby said relay is energized until said ignition key switch is open.

3,885,165
PRESS CONTROL SWITCH
Lawrence A. Franks, 609 E. Chicago Rd., and James E. Perry, 1401 W. Rishel Rd., both of Sturgis, Mich. 49091
Filed Oct. 5, 1973, Ser. No. 403,848
Int. Cl. H01h *19/14*
U.S. Cl. 307—115 **12 Claims**



1. Control switch apparatus for a multifunction machine, comprising in combination:

means defining a housing mountable on the machine to be controlled;

rotatably driveable shaft means rotatably supported on said housing;

disk means including a plurality of disk pairs on said shaft means, said disk pairs each including similar relatively circumferentially adjustable first and second slim wafer-like disks of insulative material, each said disk having a coaxial flat semicircular layer of electrically conducting material on one radial face thereof and adjacent and within the periphery thereof, the total circumferential extent of such layers corresponding to their electrically effective extent and being variable by relative rotation of said disks;

proximity pickup means axially and noncontactingly adjacent the rotational path of said layers of a disk pair for sensing the total circumferential extent of said disk pair occupied by both overlapping and non-overlapping portions of said layers opposed to said pickup means;

spacer means on said shaft means and disposed between said disk pairs for determining the axial location of said disk pairs on said shaft means and frictionally preventing unintended circumferential displacement of said disks with respect to said shaft means.

3,885,166
INTERLOCK DEVICE FOR AUXILIARY COUNTING CIRCUIT IN REPRODUCTION APPARATUS

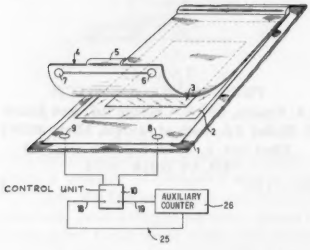
Hermann Moser, Darmstadt, and Walter Pils, Bremthal, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 9, 1973, Ser. No. 404,785

Claims priority, application Germany, Oct. 9, 1972, 2249408

Int. Cl. H01h *36/00*

U.S. Cl. 307—116 **13 Claims**



1. An interlock assembly for an auxiliary copy-counting circuit in a reproduction apparatus having a body and a movable cover for an original to be copied, comprising means to generate an electrical signal, at least one pair of induction coils on the body of the apparatus, at least one pair of induction coils on the cover of the apparatus, each coil of each pair on the cover being located over the position of a corresponding coil of each pair on the body to thereby form at least a first and a second transformer when the cover is closed over the original, each of said transformers having a primary and secondary coil, means for coupling the primary coil of said first transformer with said signal generating means, means for coupling the secondary coil of said first transformer with the primary coil of the second transformer, and control means electrically coupled with the secondary coil of the second transformer to control an auxiliary counting circuit in response to said signal from said signal generating means being coupled through said first and second transformers, whereby said control means is disabled when the cover is opened.

3,885,167
APPARATUS AND METHOD FOR CONNECTING BETWEEN SERIES AND PARALLEL DATA STREAMS

Carl Neil Berglund, Ottawa, Ontario, Canada, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 8, 1973, Ser. No. 386,774

Int. Cl. G11c *19/00;* **H03k** *17/00*

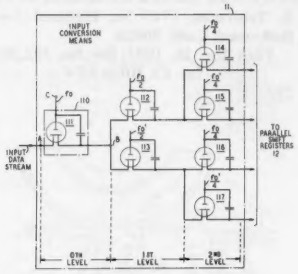
U.S. Cl. 307—221 C **25 Claims**

1. A charge transfer device shift register comprising 2^M (M is an integer greater than one) parallel intermediate shift registers each register having an input node to receive an input data stream and an output node to provide an output data stream, and conversion means for applying data from an input data stream to the register input nodes,

wherein the improvement comprises:

charge transfer device input means included in the conversion means and connected as an M-level input logic tree, and

means included in the conversion means for providing shift control of the charge transfer device input means thereby successively dividing alternate bits of data from the input data stream between two data streams until there are 2^M data streams each stream being applied to a different



register input node, the shift control having a different repetition rate at different levels of the input logic tree.

3,885,168
PEAK DETECTOR

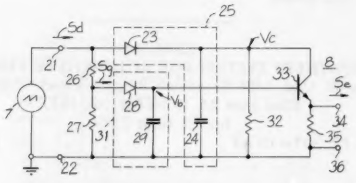
Atsushi Matsuzaki, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 427,567

Claims priority, application Japan, Dec. 26, 1973, 48-836[U]

Int. Cl. H03k *5/18, 5/20*

U.S. Cl. 307—235 A **4 Claims**



1. A circuit to respond to peak values of an applied pulsating voltage, said circuit comprising:

A. a first rectifier;

B. a first time constant circuit connected in series with said first rectifier to receive the pulsating voltage;

C. a second rectifier;

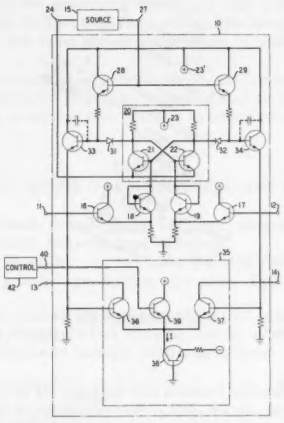
D. a second time constant circuit having a larger time constant than said first time constant circuit and being connected in series with said second rectifier to a source of a lower amplitude of said voltage; and

E. a transistor having a collector electrode connected to said first time constant circuit and a base electrode connected to said second time constant circuit for connecting said second time constant circuit to said first time constant circuit via the collector-base circuit of said transistor said transistor further including an emitter electrode connected to an output terminal and being further connected through an emitter impedance such that said transistor is operable as an emitter-follower.

3,885,169
STORAGE-PROCESSOR ELEMENT INCLUDING A BISTABLE CIRCUIT AND A STEERING CIRCUIT

John Donnell Heightley, Basking Ridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 120,834, March 4, 1971, Pat. No. 3,720,821. This application Nov. 15, 1972, Ser. No. 306,804
Int. Cl. H03k *17/00, 3/12*
U.S. Cl. 307—246 **10 Claims**



1. A storage-processor element comprising

a flip-flop circuit having first and second input terminals and first and second output terminals,

first and second input circuit means respectively for coupling double-rail input signals to the first and second input terminals, the flip-flop circuit being constrained to one of two stable states in response to the input signals and indicating the assumed state at the first and second output terminals,

first and second charge storage devices retaining previously determined charge conditions independent of the state to which the flip-flop circuit is being constrained by the input signals,

first and second asymmetrically conducting devices respectively coupling signals representing the assumed state of the flip-flop from the first and second output terminals to the first and second charge storage means for storing the assumed state of the flip-flop circuit as quantities of charge,

first and second busses, and

means for converting the charge stored in the first and second charge storage means into a predetermined magnitude of current that is steered to one or the other of the busses.

3,885,170
METHOD FOR MOTOR CONTROL

Roman Kuzyk, 436 Schiller Ave., Trenton, N.J. 08610

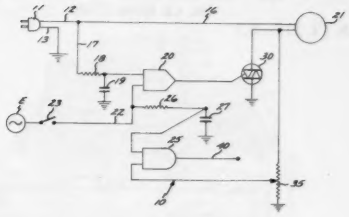
Filed May 25, 1973, Ser. No. 363,977
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 UA **6 Claims**

1. Apparatus for providing electrical signals indicative of the loading on an inductive device comprising:

switch means for selectively producing an enabling signal;

means for switching the inductive device at a predetermined phase angle relative the zero crossings of an A.C. electrical input signal, upon concurrent receipt of said enabling signal;

resistive means connected across said means for switching producing voltage signals indicative of the current lag thereacross; and

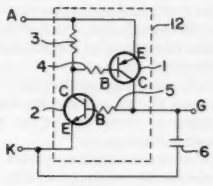


gate means connected to receive said voltage signals and said enabling signal for producing an output signal when said voltage signals are above a predetermined magnitude concurrent with the presence of said enabling signal.

3,885,171
THYRISTOR ELEMENT AND CIRCUIT

Akira Hirono, and Masayoshi Miyajima, both of Kyoto, Japan, assignors to Blackwell Electronics Ind. Co., Limited, Kyoto, Japan

Filed Nov. 3, 1971, Ser. No. 195,356
Claims priority, application Japan, Sept. 7, 1971, 46-69390
Int. Cl. H03k *17/72*
U.S. Cl. 307—252 A **4 Claims**

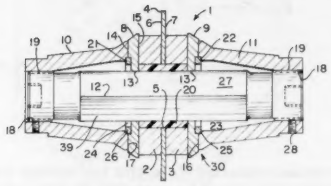


1. A semi-conductor circuit comprising: a thyristor having a gate electrode, an anode electrode, and a cathode electrode; and circuit means comprising a condenser connected between said gate electrode and said cathode electrode for preventing abrupt build-up of current flow through said thyristor and thereby reducing the generation of radio noise upon turn-on of said thyristor by extending the turn-on time of said thyristor, said thyristor being so constructed that it has an equivalent circuit including an NPN transistor and a PNP transistor, the collector of said NPN transistor being connected to the emitter of said PNP transistor through a first equivalent resistor, the collector of said NPN transistor being connected through a second equivalent resistor to the base electrode of said PNP transistor, the collector of said PNP transistor being connected to the base of said NPN transistor through a third equivalent resistor, said emitter of said PNP transistor serving as said anode electrode, said collector of said PNP transistor serving as said gate electrode, and said emitter of said NPN transistor serving as said cathode electrode, and said condenser and said first, second, and third equivalent resistors establishing a time constant which causes substantial delay in the turn-on time of said thyristor.

3,885,172
SONIC TRANSDUCER

Donald E. Miller, Mt. Prospect, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Continuation of Ser. No. 203,587, Dec. 1, 1971, abandoned. This application Dec. 21, 1973, Ser. No. 427,144
Int. Cl. H04r 17/00
U.S. Cl. 310—8.7 12 Claims

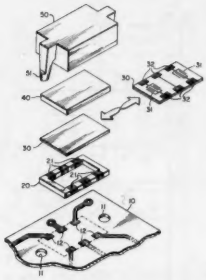


1. A transducer assembly comprising:
a force generating assembly comprising;
a first tubular means including a sleeve means at a first end and having an internal threaded portion at said first end and a flat portion at a second end;
a first annular electrostrictive element mounted adjacent said flat portion of said first tubular means and having an outside diameter about equal to the outside diameter of said first tubular means and an inside diameter greater than the least internal diameter of said first tubular means, dimensioned so that the cross-sectional area of said element multiplied by the modulus of elasticity of the element about equals the cross-sectional area of said sleeve means multiplied by the modulus of elasticity of said sleeve means;
a flat electrically conductive disk having an outside diameter greater than that of said electrostrictive element and an inside diameter about that of the inside diameter of said electrostrictive element;
a second annular electrostrictive element mounted adjacent said flat electrically conductive disk and constructed nearly identical to said first annular electrostrictive element, and
a second tubular means including a sleeve means at a first end and having an internal threaded portion at said first end and a flat portion at a second end adjacent said second electrostrictive element, dimensioned so that the cross-sectional area of said element multiplied by the modulus of elasticity of the element about equals the cross-sectional area of said sleeve means multiplied by the modulus of elasticity of said sleeve means; and
a tensioning stud of about the same material and cross-sectional area as said first and second tubular means and having a first threaded end and a seconded threaded end and fitting through said first and second force transmitting sleeve, said first and second electrostrictive elements and said flat electrically conductive disk with its first end threaded into said first end of said first sleeve and its second end threaded into said second end of said second sleeve whereby said first and second tubular means, said first and second annular spacer, said first and second electrostrictive element and said conductive disk are pressed against each other and placed in compressive strain whereby the resonant frequencies, phases and amplitudes of the stud and force generating assemblies are matched.

3,885,173
APPARATUS AND METHOD FOR COUPLING AN ACOUSTICAL SURFACE WAVE DEVICE TO AN ELECTRONIC CIRCUIT

Lawrence L. Lee, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Oct. 9, 1973, Ser. No. 404,456
Int. Cl. H01v 7/00
U.S. Cl. 310—9.4 14 Claims

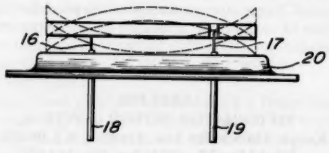


1. Apparatus for coupling an acoustic surface wave device to an electronic circuit, wherein said electronic circuit and said surface wave device have exposed conducting regions, comprising:
a gasket disposed between said surface wave device and said electronic circuit, said gasket comprised of an acoustic surface wave absorbing material, said gasket including a plurality of conducting regions;
a housing for containing said gasket and said surface wave device, said housing locating preselected conducting regions of said gasket adjacent to preselected exposed conducting regions of said surface wave device, said gasket being disposed about a region of said surface wave device containing active elements, said gasket damping acoustic surface waves propagated in a vicinity of said gasket; and
means for coupling said housing to said electronic circuit, said coupling means locating predetermined conducting regions of said gasket adjacent to preselected exposed conducting regions of said electronic circuit.

3,885,174
X-T FLEXURE PIEZOELECTRIC DEVICE

George A. Schoenfelder, Naperville, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed Jan. 16, 1974, Ser. No. 433,640
Int. Cl. H04r 17/00
U.S. Cl. 310—9.5 6 Claims



1. An improved piezoelectric crystal operative in a flexural mode comprising:
a. an elongated piezoelectric bar having a generally rectangular cross section with four major side surfaces and two end surfaces;
b. said bar having first or width and second or thickness transverse axes lying generally along the X crystallo-

graphic axis or frequency dependent transverse dimension and the Z crystallographic axis or frequency independent transverse dimension, respectively, and a longitudinal axis, one of said first and second transverse and said longitudinal axes being rotated, relative to a crystallographic axis of the piezoelectric material, and the other two of said first and second transverse and said longitudinal axes being substantially unrotated relative to the remaining crystallographic axes;

c. said bar further having a greater width than thickness;

d. an electrode fixedly positioned on each of said four major surfaces for producing flexures of said bar in a plane through the first transverse axis and the longitudinal axis of the bar upon proper energization of said electrodes; and

e. crystal mounting and connecting means connected to said electrodes for physically mounting said crystal and providing an electrical connection to said electrodes.

3,885,175

ELECTRIC MOTOR VARIABLE SPEED AND CONTROL DRIVE

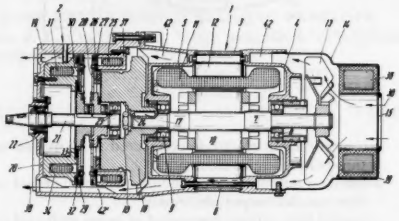
Herbert Palloch, Schwetzingen, Germany, assignor to Frankl and Kirchner, Schwetzingen, Germany

Filed Dec. 26, 1973, Ser. No. 428,194

Claims priority, application Germany, Dec. 23, 1972, 2263259

Int. Cl. H02k *11/00*

U.S. Cl. 310—68 D **6 Claims**



1. In an electric motor variable speed and control drive comprising a housing, a motor within said housing and including a drive shaft disposed within said housing and extending therefrom, a clutch and brake unit means within said housing for connecting said drive shaft to said motor and for braking said drive shaft, and a control unit means connected to said housing for operating said clutch and brake unit means in a predetermined sequence, wherein said control unit means includes a transformer, the improvement wherein said transformer is made in the form of a ring-core transformer and is mounted within said housing coaxially with respect to the axis of said motor and said clutch and brake unit means.

3,885,176

DYNAMOELECTRIC MACHINE WITH IMPROVED BEARING LUBRICATION SYSTEM

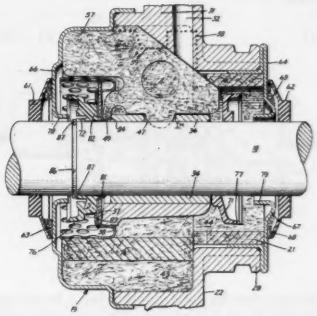
Eldon R. Cunningham, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Sept. 25, 1972, Ser. No. 292,175

Int. Cl. H02k *5/10, 5/16;* **F16c** *1/24, 13/02*

U.S. Cl. 310—88 **12 Claims**

1. A dynamoelectric machine including a shaft, a rotor mounted on the shaft for rotation therewith; bearing means including at least one sleeve type bearing rotatably supporting the shaft; and a lubrication system for the bearing means including a lubricant reservoir with lubricant retaining material disposed therein; said bearing having a lubricant admitting passage for permitting a flow of lubricant from the lubricant reservoir to a bearing surface of the bearing; and a feed wick for transferring lubricant from the lubricant reservoir to said bearing surface; said feed wick including a projection in the lubricant admitting passage of said bearing and in engagement with the shaft, said feed wick being compressively retained between the shaft and a wall portion of the lubricant reservoir to prevent inadvertent displacement of said projection from



engaging relation with the shaft; the material forming said feed wick defining at least one cut out region along a line extending in generally normal relation to the shaft and through said projection, whereby excessive contact pressures between the shaft and projection are prevented.

3,885,177

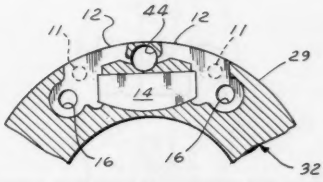
POLE-SHOE MAGNET GROUP FOR A MAGNETOMOTIVE DEVICE

Russell D. Phelon, Longmeadow, and John C. Van Amsterdam, Wilbraham, both of Mass., assignors to R. E. Phelon Company, Incorporated, East Longmeadow, Mass.

Division of Ser. No. 318,521, Dec. 26, 1972. This application June 7, 1974, Ser. No. 477,335

Int. Cl. H02k *21/22*

U.S. Cl. 310—153 **3 Claims**

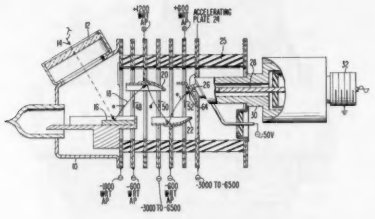


1. In combination with a flywheel having a rim of nonmagnetic material, a magneto comprising a permanent magnet, a plurality of stacked ferromagnetic laminations fastened together in clamped relation about said magnet and forming a unitary assembly embedded in said nonmagnetic material, said laminations including pole-shoe portions having a pole-shoe radius to provide surfaces of flux emanation for said group, said surfaces being generally flush with a cylindrical surface of said rim, each lamination being integral and including a web portion interconnecting the pole-shoe portions thereof and being disposed inwardly of said surfaces of flux emanation and embedded in said nonmagnetic material forming the rim of said flywheel.

3,885,178
PHOTOMULTIPLIER TUBE HAVING IMPACT IONIZATION DIODE COLLECTOR

Ronald H. Goehner, Wayne, N.J., assignor to Varian Associates, Palo Alto, Calif.

Filed July 11, 1974, Ser. No. 487,704
Int. Cl. H01j *39/02, 43/22, 43/18*
U.S. Cl. 313—1 **8 Claims**

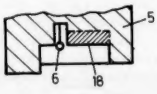


1. A photomultiplier tube comprising a hermetically sealable enclosure having a transparent area for admission of light, a photocathode positioned in said enclosure for receiving said light and converting same to free electrons, at least one dynode positioned in said enclosure for receiving said free electrons from said photocathode and multiplying same, and means positioned to receive free electrons from said dynode for simultaneously providing multiplication of received electrons and collection of same on a conductor to provide an output signal on said conductor, said means positioned to receive free electrons comprising a diode capable of multiplying and collecting received free electrons by impact ionization.

3,885,179
X-RAY TUBE

Rudolf Friedel, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 19, 1974, Ser. No. 443,864
Claims priority, application Germany, Feb. 28, 1973, 2310061
Int. Cl. H01j *35/06*
U.S. Cl. 313—60 **5 Claims**



1. An X-ray tube comprising an anode body, a cathode body and at least one incandescent cathode coil located on said cathode body to project a cathode ray beam forming a focal spot on said anode body and located out of the area onto which said focal spot is projected in rectangular direction from its surface and which area is shaped to absorb ions, said area being furnished with a heat-conducting body of refractory material.

3,885,180
MICROCHANNEL IMAGING DISPLAY DEVICE

Stanley L. Carts, Jr., Alexandria, Va., assignor to The United States Government Secretary of the Army, Washington, D.C.

Filed July 10, 1973, Ser. No. 377,987
Int. Cl. H01j *43/00, 31/26*
U.S. Cl. 313—103 **2 Claims**

1. An image display device comprising:

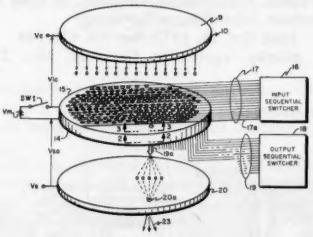
an electron producing means for producing a uniform flow of electrons;

a microchannel plate electron multiplier positioned adjacent said electron producing means;

means for selectively sequentially switching electron accelerating voltages across said microchannel plate electron multiplier, said means for selectively sequentially switching electron accelerating voltage further comprising:

a set of thin parallel input electrodes on the input side of said microchannel plate that are attached to an input sequential switcher for cyclically sweeping instantaneous input sequential voltages across each of said input electrodes;

a set of thin parallel output electrodes on the output side of said microchannel plate that are perpendicular to said input electrodes and are attached to an output sequential switcher for cyclically sweeping instantaneous output sequential voltage across each of said output electrodes wherein said cyclically sweeping instantaneous input and output sequential voltages cyclically produce a sweep of cross-over voltage points over the entire face of said microchannel plate; and



a common input electrode connected to all of said set of thin parallel input electrodes;

a common output electrode connected to all of said set of thin parallel output electrodes;

a regular bias voltage connected in series with said cyclically sweeping instantaneous input and output sequential voltages through a switch across said microchannel plate wherein said regular bias voltage is connected between said common input electrode and said common output electrode to serially add said regular bias voltage to said cyclically sweeping instantaneous input and output side of said microchannel plate at said crossover point of said input and output sequential voltages and whereby said regular bias voltage is repeatedly switched on within one complete cycle of said cyclically sweeping instantaneous input and output sequential voltages to selectively provide said high electron density area in a desired pattern i and, A means for converting electronic energy into visible energy at said output side of said microchannel plate for producing an image display according to said sequentially switched electron accelerating voltages.

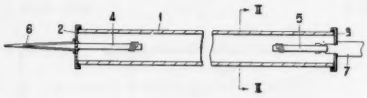
3,885,181
ELECTRIC DISCHARGE LAMPS

Evan Herbert Nelson, Twickenham, and Sydney Alfred Richard Rigden, Hemel Hempstead, both of England, assignors to The General Electric Company Limited, London, England

Filed Apr. 9, 1973, Ser. No. 349,003
Claims priority, application United Kingdom, Apr. 19, 1972, 18095/72
Int. Cl. H01j *5/16, 17/16*
U.S. Cl. 313—110 **10 Claims**

1. A high pressure electric discharge lamp comprising a tubular discharge envelope formed of transparent crystalline corundum, with a pair of electrodes disposed coaxially within

said envelope and carried respectively by closure means closing each end of the envelope, wherein at least one of the interior and exterior longitudinal surfaces of the tubular discharge envelope wall is of nonuniform conformation around the circumference such that in any cross-section of the envelope the distance of said surface from the longitudinal axis of



the envelope is less in at least one region of the cross-section than in the remainder of the cross-section, the cross-sectional conformation of the envelope wall being uniform throughout the length of the envelope, whereby the polar distribution of light emitted from the lamp as a whole, in operation of the lamp, is non-uniform around the circumference of the envelope.

3,885,182

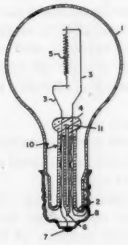
LAMP HAVING LIGHT DIFFUSING ENVELOPE

Gordon P. K. Chu, Danvers, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Sept. 20, 1973, Ser. No. 399,100

Int. Cl. H01k *1/26, 1/28*

U.S. Cl. 313—116 **1 Claim**



1. An incandescent lamp comprising a filament disposed within a light diffusing uniformly crystallized glass envelope, the entire envelope being crystallized, which is sealed at its lower end to the flare of a stem press glass mount, the envelope having a high efficiency of light transmission, the glass composition of said envelope being as follows:

LiO_2	8 to 20%
Na_2O and/or K_2O	1 to 7%
SiO_2	45 to 72%
Al_2O_3	4 to 20%
CaO and/or SrO and/or BaO and/or MgO	0.6 to 7%
B_2O_3	1 to 4%
As_2O_3 and/or Sb_2O_3 and/or P_2O_5 and/or MoO_3	2 to 7%.

3,885,183

THYRATRONS

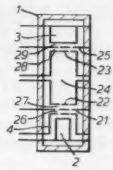
Hugh Menown, Writtle, and Eric Jones, Chelmsford, both of England, assignors to English Electric Valve Company Limited, Chelmsford, Essex, England

Filed Jan. 2, 1974, Ser. No. 430,251

Claims priority, application United Kingdom, Jan. 9, 1973, 1164/73

Int. Cl. H01j *17/12*

U.S. Cl. 313—195 **11 Claims**



1. A multi-gap gradient-grid thyratron comprising an envelope, an anode and a cathode within the envelope, a control grid between the anode and the cathode and a succession of gradient-grids between the control grid and the anode, the gradient-grids being alternately of the short and long type.

3,885,184

HIGH-PRESSURE DISCHARGE LAMP

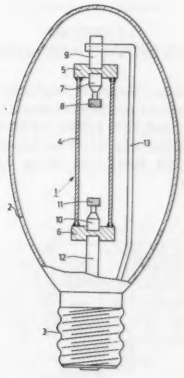
Bralt Renze Schat, and Abraham Timmermans, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 13, 1973, Ser. No. 332,117

Claims priority, application Netherlands, Feb. 21, 1972, 7202269

Int. Cl. H01j *61/30, 61/82*

U.S. Cl. 313—220 **8 Claims**

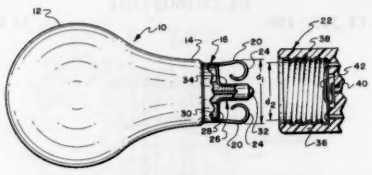


1. A high-pressure discharge lamp for use with an associated ballast comprising a discharge tube which includes at least one internal electrode and a current lead-through conductor connected to said electrode, the electrical resistance of the path of the current through said lead-through conductor between the outer wall and the inner wall of the discharge tube being so large that in the operating condition of the lamp, the product of said resistance (in ohms) and the current (in amperes) through said lead-through conductor is more than 1.0.

3,885,185
INCANDESCENT LAMP

Ralph E. Tilley, 336 E. South Temple, Salt Lake City, Utah 84111

Filed Mar. 29, 1974, Ser. No. 456,097
Int. Cl. H01j 5/48, 5/50
U.S. Cl. 313—318 4 Claims



1. An incandescent lamp for rectilinear insertion into press-fit conducting relation with a conventional threaded electrical socket comprising:

a bulb having an axis, the bulb containing a filament and having a necked down trailing end;

first conductor means connected to one end of the filament and mounted to the necked down trailing end of the bulb, said first conductor means comprising a plurality of axially extending, rearwardly directed, and outwardly radially biased resilient conductive fingers with memory, each finger being initially resiliently biased a predetermined radial distance from the axis of the bulb to form an initial composite diameter greater than the diameter of said threaded socket;

second conductor means carried in exposed relation at the trailing end of the bulb and connected to the other end of the filament; and

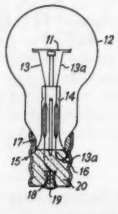
electrical insulating means disposed between the first and second conductor means;

whereby the resilient fingers are inwardly deflected reducing said composite diameter to one equal to the socket diameter upon rectilinear insertion of the trailing end of the lamp into the socket, the memory of the resilient fingers insuring electrical conduction with a conductor at the socket threads.

3,885,186
LAMP CAP CONNECTIONS USING SUPERPLASTIC ALLOY

Arthur Samuel Vause, London, England, assignor to Thorn Electrical Industries Limited, London, England

Division of Ser. No. 366,739, June 4, 1973, Pat. No. 3,818,558. This application Apr. 1, 1974, Ser. No. 457,064
Int. Cl. H01j 5/54; B23k 35/24
U.S. Cl. 313—318 9 Claims

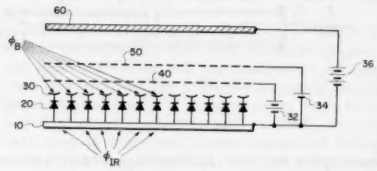


1. An electric lamp having an hermetically-sealed envelope through which a lead-in conductor is sealed, said conductor terminating outside said envelope and said conductor being embedded in a mass of an alloy which is capable of exhibiting superplastic properties, said alloy forming an electrical terminal.

3,885,187
PHOTODIODE CONTROLLED ELECTRON VELOCITY SELECTOR IMAGE TUBE

Alvin D. Schnitzler, Camp Springs, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 11, 1973, Ser. No. 405,731
Int. Cl. H01j 31/12
U.S. Cl. 313—368 8 Claims



1. A photodiode controlled electron velocity selector image tube in a vacuum envelope comprising:

a P-type material substrate having a plurality of electrically isolated photosensitive junctions comprising a plurality of evenly spaced N-type material islands on a front side of said P-type material substrate and a layer of electrical insulation contiguous with the entire front side of said P-type material substrate but only around the periphery of said N-type material islands;

a solid antireflection coating contiguous with a back side of said P-type material substrate;

a plurality of discrete thin metal islands contiguous with said N-type material islands and said layer of electrical insulation wherein said thin metal islands are spread over said layer of electrical insulation in close proximity to but electrically isolated from each other;

a plurality of discrete electrically isolated photoemitters contiguous with and covering the entire lateral surface of said plurality of discrete thin metal islands wherein said plurality of electrically isolated photoemitters are serially connected to said plurality of electrically isolated photosensitive junctions through said plurality of thin metal islands with each related photosensitive junction and photoemitter forming a plurality of discrete photocathode elements;

an electroluminescent screen;

a plurality of fine mesh grids positioned between said plurality of discrete electrically isolated photoemitters and said electroluminescent screen;

a voltage divider source having voltage taps therefrom connected in step up voltage from said antireflection coating through said plurality of fine mesh grids to said electroluminescent screen for velocity controlling the electrons emitted from said discrete electrically isolated photoemitters to said electroluminescent screen;

a bias light source for uniform illumination of the front surface of said plurality of discrete electrically isolated photoemitters for producing electron current saturation therefrom; and

an infrared image radiation source for projecting an image on said antireflection coating such that the resistance across each of said plurality of electrically isolated photosensitive junctions is in direct relation to the intensity of said radiation source image to cause a change in velocity of electrons emitted from each of said plurality of photoemitters with relation to the fixed voltages on said plurality of fine mesh grids, and wherein said plurality of discrete thin metal islands inhibits said bias light illumination from entering said plurality of N-type material islands yet allows easy movement of electrons from said N-type material islands into said photoemitters.

3,885,188
TARGET ASSEMBLY FOR STORAGE TUBES AND A METHOD OF MAKING THE SAME

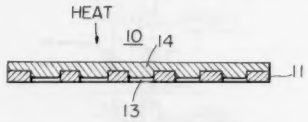
Yujiro Koike; Haruo Maeda; Tsutomu Nishino; Akimitu Aoyama, and Yuji Mogi, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company Limited, Osaka, Japan

Filed Mar. 16, 1973, Ser. No. 341,898

Claims priority, application Japan, Mar. 17, 1972, 47-27766

Int. Cl. H01j *1/53*

U.S. Cl. 313—394 **3 Claims**



1. A target assembly for use with charge storage tubes, comprising a screen having interstices therein and a film of an organic compound of a resistivity of at least 10^{15} ohm-cm deposited on said screen, wherein said organic compound is selected from the group consisting of polyimide and polyamideimide, and wherein said compound has a uniform thickness over the entire target surface, whereby said organic compound is capable of storing electrostatic charges for an extended period of time.

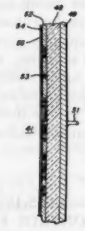
3,885,189
CATHODE RAY TUBE MONOSCOPE WITH SEMICONDUCTOR TARGET

Amos Picker, Sharon, and Wolfgang Feist, Burlington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 283,126, Aug. 23, 1972, which is a division of Ser. No. 76,920, Sept. 30, 1970, abandoned. This application Dec. 6, 1973, Ser. No. 422,449

Int. Cl. H01j *31/58, 31/08*

U.S. Cl. 313—401 **5 Claims**



1. In combination:
a cathode ray tube display device;
a signal generating device comprising:
a source of electrons;
a target comprising:
a supporting plate;
a wafer of semiconductor material having first and second surfaces, said second surface being coupled to said supporting plate;
a layer of insulating oxide material disposed upon said first surface of said wafer, said layer having apertures formed therein in predetermined character patterns;
a plurality of regions of dielectric material upon said first surface of said semiconductor wafer, said dielectric material having a conduction band close to that of said wafer, said regions of dielectric material being disposed through said apertures in said layer of insulating oxide material;
a layer of conductive material covering said dielectric material;
means for providing a bias voltage between said regions of dielectric material and said semiconductor wafer;
means for directing electrons from said source to said target to produce multiplications of said electrons in said semiconductor layer; and
means for feeding signals from said signal generating device to said display device.

3,885,190
SHADOW MASK HAVING ALL SURFACES METAL-COATED

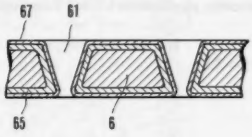
Masao Taniguchi; Hiromi Kanai, both of Mobara, and Eiichi Yamazaki, Ichihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 11, 1973, Ser. No. 350,067

Claims priority, application Japan, Apr. 12, 1972, 47-42437[U]

Int. Cl. H01j *29/06, 29/08, 31/20*

U.S. Cl. 313—402 **10 Claims**



1. A colour picture tube of the class comprising a neck, a funnel, an electron gun assembly contained in the neck, a fluorescent screen of colour display type coated on the inner surface of the panel in triads and a colour selection electrode, made of iron and having a plurality of perforations, adjacent to the fluorescent screen for transmitting the electron beams emanated by the electron gun assembly to predetermined portions of the fluorescent screen, and a metal layer applied onto all surface areas of the colour selection electrode for increasing the strength of said colour selection electrode.

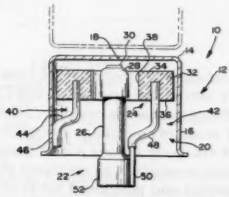
3,885,191
CATHODE-GRID ASSEMBLY FOR A CATHODE RAY TUBE

Donald R. Kerstetter, Emporium, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 6, 1974, Ser. No. 448,681

Int. Cl. H01j *29/02, 29/48*

U.S. Cl. 313—447 **7 Claims**



1. A cathode-grid assembly for a cathode ray tube comprising:
a substantially cup-shaped grid having a closed end containing a substantially centrally located aperture and a projecting contiguous side wall, said closed end and said side wall defining a hollow interior; and
a cathode and a cathode support positioned within said hollow interior;

said cathode comprising a hollow metallic sleeve closed at one end by a cathode cap the outermost surface of which contains an electron emissive material;

said cathode support comprising an electrically insulating member of a size to fit within said hollow interior and having upper and lower surfaces;

a substantially centrally located cathode aperture interconnecting said upper and lower surfaces and first and second means extending from said lower surface for respectively mounting said support within said hollow interior and for mounting said cathode.

3,885,192

FUNDAMENTAL COUPLED TRAVELLING WAVE TUBE HAVING A PERIODIC PERMANENT MAGNETIC FOCUSSING STRUCTURE

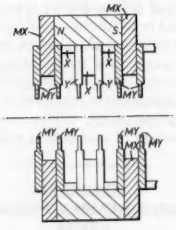
Maurice Esterson; Robin Charles Moorehouse King, and John Frederick Gregory, all of Essex, England, assignors to English Electric Valve Company Limited, Chelmsford, Essex, England

Filed Feb. 15, 1974, Ser. No. 442,884

Claims priority, application United Kingdom, Feb. 16, 1973, 7682/73

Int. Cl. H01j *26/34*

U.S. Cl. 315—3.5 **7 Claims**



1. A coupled cavity travelling wave tube including a stack of alternately slotted and apertured plates assembled to provide a plurality of successive coupled cavities coupled for the fundamental mode of operation; a magnetic pole piece provided at each *n*th cavity (where *n* is an integer greater than 2) which pole piece consists of an apertured plate made of ferromagnetic material and positioned between a pair of thinner slotted plates which also consist of ferromagnetic material and which have regions extending the ferromagnetic path, provided by the first mentioned apertured plate, close to the electron beam path of the tube, each pair of said thinner slotted plates being spaced apart from each other by the thickness of the first mentioned apertured plate to define a cavity between them; a periodic permanent magnetic focussing structure surrounding said stack and consisting of ring shaped magnets which provide permanent magnetic fields through said pole pieces to said electron beam path.

3,885,193

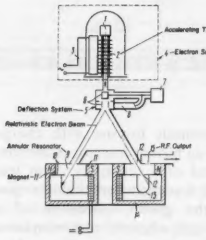
MICROWAVE ELECTRON DISCHARGE DEVICE

Gersh Itskovich Budker, ulitsa Maltseva, 6; Marlen Moiseevich Karliner, Morskoi prospekt, 60, kv. 14; Ivan Grigorievich Makarov, Zhemchuzhnaya, 24, kv. 15; Sergei Nikolaevich Morozov, ulitsa Zolotodolinskaya 27, kv. 30; Oleg Alexandrovich Nezhevenko, ulitsa Tereshkovoi, 7, kv. 1; Gennady Nikolaevich Ostreiko, Morskoi prospekt, 60, kv. 24, and Isai Abramovich Shekhtman, ulitsa Ilicha, 15, kv. 68, all of Novosibirsk, U.S.S.R.

Filed Aug. 24, 1973, Ser. No. 391,314

Int. Cl. H01j *25/22*

U.S. Cl. 315—5.25 **4 Claims**



1. A microwave electron discharge device, comprising beam-producing means for forming a charged particle beam; an accelerating tube positioned at the output of said beam-producing means for imparting to particles of said beam a velocity close to the velocity of light; a deflection system for circular scanning of said beam at a predetermined input signal frequency, said deflection system being mounted subsequent to said accelerating tube in the direction of beam travel along the axis of said accelerating means; a hollow annular resonator disposed subsequent to said deflection system in the direction of beam travel along the axis of the deflection system, said resonator having circular slots in its walls to permit the ingress of a circularly scanned beam and egress of the beam out of the resonator, said resonator being internally dimensioned and shaped to support the traveling along an annulus of an electromagnetic wave at a frequency comprising a multiple of the frequency of said beam scanning, said electromagnetic wave having its electric field substantially parallel to the direction of the motion of said beam particles; a collector mounted after said annular resonator in the direction of beam travel for receiving the charged particle beam upon exiting the resonator.

3,885,194

TEMPERATURE CONTROL FOR AN INDIRECTLY HEATED CATHODE FOR A HIGH POWER ELECTRON BEAM GUN

Berthold W. Schumacher, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

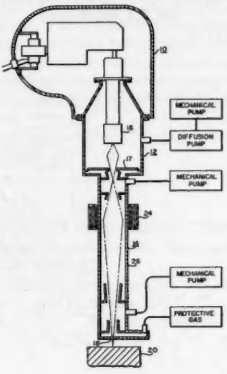
Filed Apr. 30, 1973, Ser. No. 356,018

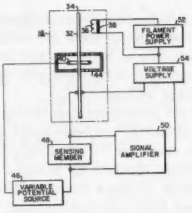
Int. Cl. H05b *39/04*

U.S. Cl. 315—107 **3 Claims**

1. In combination with an electron gun for generating a high power electron beam, which electron gun includes an elongated cathode member and cathode heater means associated therewith for electron bombardment heating of the cathode member, with the electron beam being drawn from one end of said cathode member, and wherein the temperature of the cathode member significantly affects the electron beam emission, the improvement comprising a ring conductive electrode disposed about the cathode member at a location spaced from the electron beam emission end portion of the cathode member, with a secondary emitted electron current flow produced between said cathode member and said ring conductive electrode, a shielding enclosure disposed about the ring conduc-

tive electrode with the cathode member passing through the shielding enclosure, and sensing means electrically connected to the ring conductive electrode for measuring the secondary





emitted electron current and indicating the temperature of the cathode member as a function of said secondary emitted electron current.

3,885,195

FLAT PANEL DISPLAY APPARATUS HAVING ELECTRODES ALIGNED WITH ISOLATING BARRIER RIBS

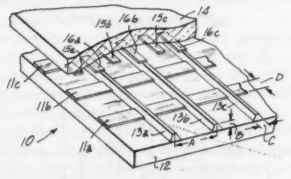
Yoshifumi Amano, Zushi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 14, 1973, Ser. No. 424,692

Claims priority, application Japan, Dec. 21, 1972, 47-128450

Int. Cl. H05b *41/00*

U.S. Cl. 315—169 TV **5 Claims**



1. A flat panel display apparatus comprising: a first insulator plate, a second insulator plate, a plurality of first parallel electrodes attached to said first plate, a plurality of insulating parallel barrier ribs mounted on said first plate so as to cross over said plurality of first electrodes, said barrier ribs intersecting said first electrodes and projecting toward said second plate, a plurality of second parallel electrodes attached to said second plate, said second electrodes parallel with said barrier ribs and positioned between said barrier ribs, the edges of said first and second plates sealed and a gas capable of glowing mounted between said plates, a plurality of barrier electrodes attached to said second plate, and said barrier electrodes positioned between said second electrodes and aligned with said insulating barrier ribs.

3,885,196

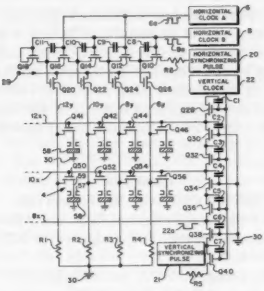
POCKETABLE DIRECT CURRENT ELECTROLUMINESCENT DISPLAY DEVICE ADDRESSED BY MOS OR MNOS CIRCUITRY

Albert G. Fischer, Pittsburgh, Pa., assignor to The United States Government Secretary of the Army, Washington, D.C.

Division of Ser. No. 310,737, Nov. 30, 1972, Pat. No. 3,807,037. This application Nov. 28, 1973, Ser. No. 419,829

Int. Cl. H05b *41/02*

U.S. Cl. 315—169 TV **3 Claims**



1. An electroluminescent display panel comprising:

an insulating substrate having a matrix of feedthrough holes therethrough;

a matrix of metallic oxide semiconductors having a gate, a drain, and a source electrode, said metallic oxide semiconductors positioned on a back side of said substrate; and

a matrix of electroluminescent elements on a front side of said substrate wherein each of said drain electrodes is connected directly to one of said matrix of electroluminescent elements and said source electrodes are connected to column leads and said gate electrodes are connected to row leads whereby the outputs from shift registers trigger video information into said metallic oxide semiconductors according to information fed into said shift registers.

3,885,197

LIGHT DIMMER

Adrian Moses, Newhall, Calif., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Feb. 1, 1974, Ser. No. 438,687

Int. Cl. H05b *39/02*

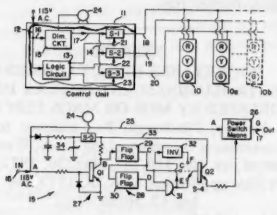
U.S. Cl. 315—194 **6 Claims**

2. A dimmer circuit for dimming traffic lights wherein the lights are controlled by a logic circuit requiring a given source of alternating voltage for operation, and wherein the traffic lights are connected to said source through switches controlled by said logic circuit, said dimmer circuit including, in combination:

a. input and output terminals for interposition between said source and said switches;

b. detecting means connected to said input terminal to provide clock signals having a frequency determined by the frequency of alternating voltage;

c. divider means connected to receive said clock signals and provide a control output pulse responsive to the reception of N clock signals, said output pulse having a time duration corresponding to the time for n clock signals to be received where n N; and

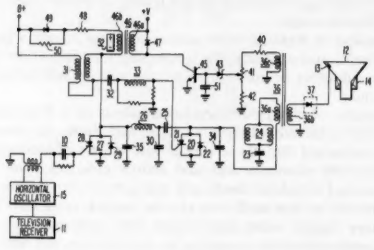


d. a power switch means connected between said input terminal and output terminal and having a gate control terminal connected to receive said output pulse whereby said power switch is opened for a period corresponding to the width of said output pulse so that n/N of the power is not passed to said lights as a result of the blockage of n whole wave form cycles by said power switch.

3,885,198
HIGH VOLTAGE REGULATOR

Dalton Harold Pritchard, Princeton, N.J., and Alfred Christian Schroeder, Southampton, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 6, 1973, Ser. No. 385,777
Int. Cl. H01j *29/70*
U.S. Cl. 315—411 **5 Claims**

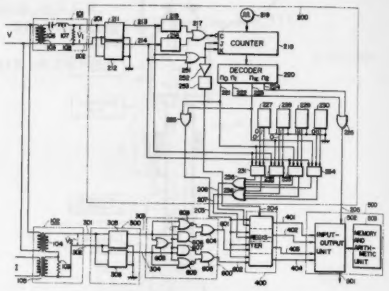


1. In a deflection system, a voltage regulator, comprising:
a terminal supplying operating current;
variable inductance means coupled to said terminal;
switching means coupled to said variable inductance means for receiving operating current therefrom and operable from a first to a second state during each deflection cycle;
output circuit means including a deflection winding and a transformer coupled to said switching means for receiving alternating current energy therefrom during each deflection cycle;
regulating means coupled to said output circuit and to said variable inductance means and responsive to the amplitude of energy in said output circuit means for controlling the inductance of said variable inductance means;
said variable inductance means including biasing means for providing a fixed magnitude magnetic field component in said variable inductance means for limiting the peak current supplied to said switching means independent of the operation of said regulating means.

3,885,199
PROTECTIVE RELAYING DEVICE

Haruo Nohara; Junichi Makino, and Manabu Masuda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed July 2, 1973, Ser. No. 375,731
Int. Cl. H02h *3/26*
U.S. Cl. 317—27 R **8 Claims**

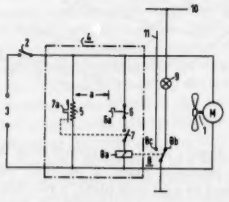


1. A protective relaying device comprising:
a first means for producing, from the voltage and current of the transmission line to be protected, two voltages essential for the protection of said line, one of said two voltages being a reference voltage;
a second means for producing first timing signals indicative of the respective instants when said reference voltage changes from negative to positive polarity, when said reference voltage reaches its positive peak, when said reference voltage changes from positive to negative polarity and when said reference voltage reaches its negative peak and for producing first sign signals corresponding to the states of said reference voltage at said respective instants;
a third means for producing second sign signals corresponding to the states of the other of said two voltages;
a fourth means for renewing and holding said first and second sign signals each time said first timing signals are generated; and
a fifth means for receiving said first and second sign signals to judge the necessity of protection on the basis of the combination of said first and second sign signals.

3,885,200
MONITORING ARRANGEMENT FOR A BLOWER

Peter Burkle, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 26, 1973, Ser. No. 418,981
Claims priority, application Germany, Nov. 28, 1972, 2258252
Int. Cl. H02h *5/04*
U.S. Cl. 317—40 R **5 Claims**



1. A monitoring arrangement for a blower comprising:

a. a current carrying resistor in parallel with the blower motor and physically arranged in the air stream of the blower;

b. first means for sensing temperature spaced from said resistor said means including a first switch, said first means adapted to operate said first switch when the temperature exceeds a first predetermined limit;

c. second means for sensing temperature said means being placed in the immediate vicinity of said resistor and including a second switch adapted to operate if the temperature of said resistor falls below a second predetermined limit; and

d. indicator means supplied by said first and second switches in series.

3,885,201

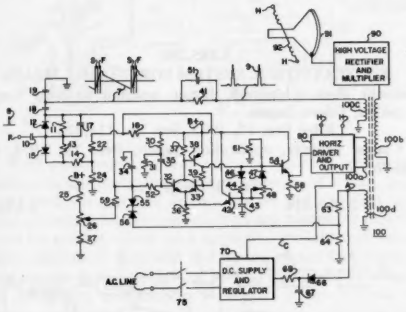
FAIL-SAFE HIGH VOLTAGE PROTECTION CIRCUIT

Ronald Eugene Fernsler, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 28, 1974, Ser. No. 473,860

Int. Cl. H04n *5/44*

U.S. Cl. 317—51 **6 Claims**



1. A high voltage protection circuit for rendering a display on a kinescope unviewable when excessive high voltage is coupled thereto, comprising:

a deflection generator;

high voltage supply means coupled to said deflection generator for generating said high voltage;

means coupled to said deflection generator for producing voltage variations representative of said generated high voltage variations;

power supply and regulating means coupled to said deflection generator and to said means for producing voltage variations and responsive to said voltage variations for regulating direct current operating voltage supplied to said deflection generator for maintaining said generated high voltage substantially constant;

oscillator means coupled to said deflection generator;

automatic frequency control means coupled to said deflection generator and to said oscillator for producing a first direct current control voltage for controlling the frequency of said oscillator; and

means coupled to said means for producing voltage variations representative of said high voltage variations and to said automatic frequency control means for providing a second direct current control voltage thereto, said first and second control voltages being combined for controlling said oscillator at a desired frequency and said second direct current control voltage being related in amplitude to said voltage variations for rendering the display on said kinescope unviewable when said amplitude becomes excessive corresponding to excessive high voltage.

3,885,202

EXCESS VOLTAGE ARRESTERS

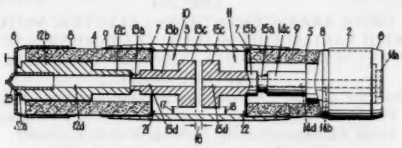
Basil Offor Baker, Rickmansworth, and John William Ellis Ross, Sidcup, both of England, assignors to The M-O Valve Company Limited, London, England

Filed Mar. 21, 1974, Ser. No. 453,323

Claims priority, application United Kingdom, Mar. 23, 1973, 14139/73

Int. Cl. H02h *9/04*

U.S. Cl. 317—61 **4 Claims**



1. An excess voltage arrester comprising: a hollow cylindrical gas-filled enclosure comprising a tubular electrically conductive central portion, a pair of electrically conductive end portions, and a pair of tubular electrically insulating portions by means of which said end portions are respectively sealed to and spaced from said central portion; a pair of spaced electrodes housed within the enclosure for which said end portions serve as respective terminals, said electrodes extending towards one another through said insulating portions of the enclosure so that the gap between the electrodes lies within the central portion of the enclosure; and means for restricting the cathode spot formed in operation on the inner end of either electrode to a region adjacent the inner end of that electrode; the dimensions of the gaps, via the gas-filling, between the electrodes and the central portion of the enclosure, and between the electrodes and the internal surfaces of the insulating portions of the enclosure being such that the d.c. ignition voltage across the gap between the inner end of each electrode and the adjacent part of the central portion of the enclosure is less than the breakdown voltage across any gap between a point on the surface of that electrode and a conductive coating which may be produced in operation on the internal surface of the insulating portion of the enclosure through which that electrode extends.

3,885,203

EXCESS VOLTAGE ARRESTERS

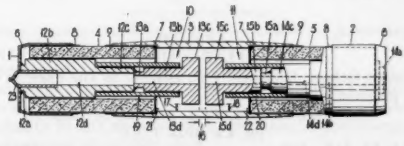
Basil Offor Baker, Richmansworth, and John William Ellis Ross, Sidcup, both of England, assignors to The M-O Valve Company Limited, London, England

Filed Mar. 21, 1974, Ser. No. 453,322

Claims priority, application United Kingdom, Mar. 23, 1973, 14138/73

Int. Cl. H02h *9/04*

U.S. Cl. 317—61 **5 Claims**



1. An excess voltage arrester comprising: a hollow cylindrical gas filled enclosure comprising a tubular electrically conductive central portion, a pair of electrically conductive end portions, and a pair of tubular electrically insulating portions by means of which said end portions are respectively sealed to and spaced from said central portion; a pair of spaced electrodes housed within the enclosure for which said end portions serve as respective terminals, said electrodes extending to-

wards one another through said insulating portion of the enclosure so that the gap between the electrodes lies within the central portion of the enclosure; and a pair of sleeves of electrically insulating material carried on said electrodes respectively, each sleeve extending from a point near the inner end of the associated electrode to a point within the insulating portion of the enclosure through which the associated electrode extends.

3,885,204

DRIVE ARRANGEMENT USING ELECTRIC MOTOR WITH VARIABLE HYDRAULIC TRANSMISSION SET IN PREDETERMINED RELATIONSHIP TO MINIMIZE BATTERY DRAIN

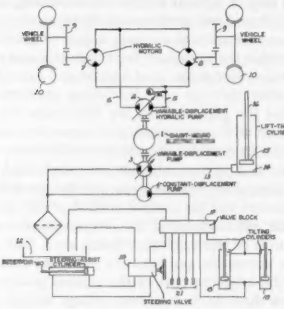
Theodore Abels, Aschaffenburg-Nilkheim, and Siegfried Puschel, Aschaffenburg, both of Germany, assignors to Linde Aktiengesellschaft, Hollriegelkreuth, Germany

Filed Apr. 26, 1973, Ser. No. 354,862

Claims priority, application Germany, Apr. 26, 1972, 2220570

Int. Cl. H02p *5/06*

U.S. Cl. 318—139 **22 Claims**



1. A drive system comprising, in combination a storage battery; a shunt-wound electric motor having a field-excitation coil connected in shunt with an armature across said battery; a stepless variable hydraulic transmission including a hydraulic pump drivingly connected to said electric motor and a hydraulic motor operatively connected to a load and in fluid communication with said pump; and control means for varying the excitation current of said field coil, said transmission comprising a transmission control element for varying the speed ratio between said pump and said hydraulic motor, said control means for varying the current through said field coil including a current-control element for joint and simultaneous regulation of the current through said field coil and said ratio in a predetermined relationship to minimize battery drain.

3,885,205

CONTROLLED ROTOR MOTOR

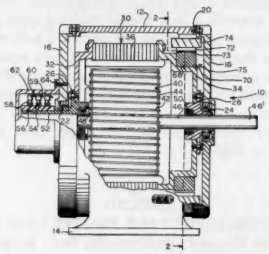
Robert Helmer, Setauket, N.Y., assignor to The Enercon Corporation, Setauket, N.Y.

Filed Nov. 16, 1972, Ser. No. 307,013

Int. Cl. H02k *17/00*

U.S. Cl. 318—302 **12 Claims**

1. An electric motor for driving a mechanical load comprising: a stationary housing; a first rotatable means wholly comprising the secondary of said motor extending axially of said housing and being rotatable in a selected direction for driving said load; a second rotatable means having slotted laminations and field coil windings therein surrounding said first rotatable means and extending axially in said housing for magnetically rotating said first rotatable means in one direction when said first rotatable means coupled to said load, a hardened high hysteresis steel ring being mounted on said second rotatable means for rotation therewith; said second rotatable means being rotatable in a direction opposite to that of said first rotatable means; control means comprising a plurality of



electromagnets mounted on said stationary housing for retarding the rotation of said second rotatable means to vary the speed of rotation of said first rotatable means in said selected direction.

3,885,206

PHASE CONTROL SYSTEM FOR ROTARY MEANS

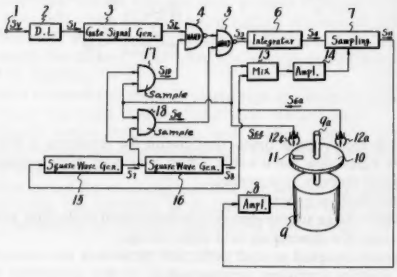
Takeshi Hort, Chigosaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 12, 1973, Ser. No. 424,073

Claims priority, application Japan, Dec. 18, 1972, 47-126865

Int. Cl. H02p *5/16*

U.S. Cl. 318—314 **8 Claims**



1. A phase control system for a rotary member comprising:

reference signal generating means for generating a reference signal representing a predetermined rotary phase relationship for said rotary member; position signal generating means disposed to sense when said rotary member rotates to predetermined angular positions and to generate first and second position signals in response thereto;

square-wave signal generating means for generating a square-wave signal which has a predetermined phase relation with respect to the first position signal generated by said position signal generating means;

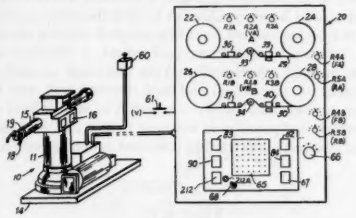
comparator means for comparing the second position signal generated by said position signal generating means with the square-wave signal, said comparator means exhibiting a first condition when the second position signal is in phase leading relationship with respect to said square-wave signal, a second condition when the second position signal is in phase lagging relationship with respect to said square-wave signal, and a third condition when the second position signal is in a predetermined phase range with respect to said square-wave signal; and

control signal generating means for generating a control signal to control the rotation of said rotary member in accordance with the phase relationship between said reference signal and at least one of said first and second position signals and further in accordance with the condition exhibited by said comparator means.

3,885,207
OPTIMIZED EDITING SYSTEM FOR A SERVO CONTROLLED PROGRAM RECORDING SYSTEM

Clayton Du Bosque, Jr., New Canaan, Conn., and Jeffrey Lowenson, Annandale, Va., assignors to AMF Incorporated, White Plains, N.Y.

Filed Jan. 17, 1973, Ser. No. 324,409
Int. Cl. G05b *19/42*
U.S. Cl. 318—568 **23 Claims**



1. Work performing apparatus having a control system for providing signals that control the movements of a work performing unit wherein said control system includes first and second recording mechanisms each having means for recording and for sensing signals on a respective movable recording medium associated therewith and having means for coupling sensed signals from said first or second mechanisms to said work performing unit thereby to control its movements in response to the sensed signals, and means for operating the recording mechanisms of the apparatus to sense a recorded cycle of signals on a recording medium associated with the first recording mechanism and to record the sensed signals onto the recording medium associated with the second recording mechanism; the improvement in said control system comprising:

mode selector means constraining said work performing unit to execute movements corresponding to a playback of said recorded cycle of signals on said first recording medium while transcribing said signals on said second recording medium; and

control means for selectively modulating the playback of said recorded cycle of signals on said first recording medium to selectively optimize the movements of said work performing unit and correspondingly modulate said transcribed cycle of signals on said second recording medium to provide a recorded program of said optimized movements of said work performing unit on said second recording medium.

3,885,208
DEVICE FOR AUTOMATIC THERMOCHEMICAL ANALYSIS

Guy Berthelot, Ivry; Philippe Guillot, Versailles, and Jean-Jacques Perez, Chatillon, all of France, assignors to Commissariat a L'Energie Atomique, Paris, France

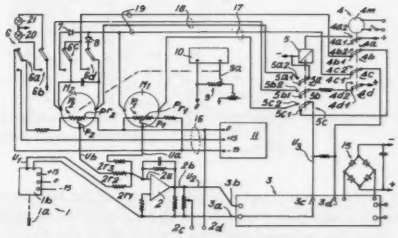
Filed Sept. 17, 1973, Ser. No. 397,728
Claims priority, application France, Oct. 2, 1972, 72.34888
Int. Cl. G05b *11/32*
U.S. Cl. 318—625 **6 Claims**

1. A device for the automatic thermochemical analysis of the concentration of chemical substances in solution, wherein said device comprises in combination:

a temperature detector which delivers a linear voltage as a function of the temperature of the solution,

an elctronic summation device controlled by the linear voltage of the detector,

two servomechanisms, the first servomechanism being employed for the initial zero-resetting of the summation device and the second servomechanism being employed for zero-resetting the unbalance voltage which is measured at absolute value at the output of the summation device,



an amplifier which amplifies the output voltage of the summation device, said voltage being applied to the servomechanisms,

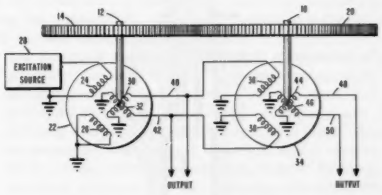
a programmer for the sequential starting of the servomechanisms,

a reverser for controlling the direction of the thermochemical reaction of the solution, said reverser being inserted in the second servomechanism.

3,885,209
TWO SPEED CONTROL SYSTEMS

Howard Lazarus, Syosset, N.Y., assignor to Astrosystems, Inc., Lake Success, N.Y.

Filed Dec. 27, 1973, Ser. No. 428,772
Int. Cl. G05b *11/12*
U.S. Cl. 318—692 **7 Claims**



1. In a two-speed control system, apparatus for generating two-speed position signals, comprising:

a. first and second rotatable shafts;

b. mechanical means coupling said second shaft to said first shaft and causing the angle of rotation of said second shaft to be linearly proportional but unequal to the angle of rotation of said first shaft;

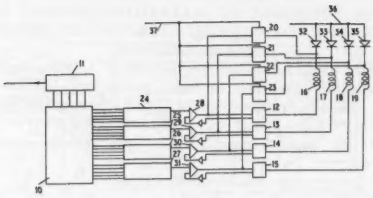
c. a first transducer mechanically coupled to said first shaft and producing a plurality of first output voltages indicative of the angle of rotation of said first shaft;

d. a second transducer mechanically coupled to said second shaft and having its input electrically coupled to the output of said first transducer, said second transducer being excited by said first output voltages and producing a plurality of second output voltages indicative of the difference between the respective angles of rotation of said first and second shafts.

3,885,210
DRIVE CIRCUITS FOR STEPPING MOTORS

Alan Burnett, Coventry, England, assignor to Wickman Machine Tool Sales Limited, Coventry, Warwickshire, England

Filed Nov. 21, 1973, Ser. No. 418,064
Claims priority, application United Kingdom, Dec. 6, 1972, 56204/72
Int. Cl. H02k *37/00*
U.S. Cl. 318—696 **4 Claims**

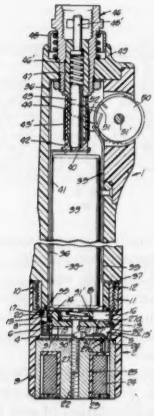


1. A drive circuit and a stepping motor of the kind incorporating a plurality of windings which are energized in sequence to effect the required stepping movement of the motor, said drive circuit comprising means for selectively varying the current flowing in each winding in unequal incremental steps between zero and a maximum value, and means permitting selection of the magnitude of each incremental step independently of the other incremental steps, so as to enable the incremental steps to be set independently to match the non-linear characteristic of the motor to obtain equal incremental steps of the motor.

3,885,211
RECHARGEABLE BATTERY-OPERATED ILLUMINATING DEVICE

Jeno B. Gutai, Thousand Oaks, Calif., assignor to Statham Instruments, Inc., Oxnard, Calif.

Filed Sept. 16, 1974, Ser. No. 506,104
Int. Cl. F21l *7/00*; **H02m** *45/04*
U.S. Cl. 320—2 **7 Claims**

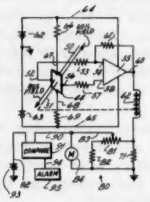


1. A rechargeable battery-operated device, comprising a tubular housing, a secondary electromagnetic coil including a metallic core, a first terminal and a second terminal connected to said coil, a coil spring positioned in said tubular housing adjacent to said secondary coil, an electrical connection between said spring and the first terminal, a first electrical conduit connected to said first terminal and to said spring and extending along the interior of said housing, a rectifier positioned adjacent to said secondary and connected to the said second terminal, a second electrical conduit connected to said rectifier and extending along the said housing, a third electrical conduit electrically connected to said second electrical conduit, a power takeoff comprising a first power takeoff terminal and a second power takeoff terminal, said takeoff including an insulating tubular member, a first plunger and a second plunger in said tubular member, a second coil spring in said tubular member positioned between said first and second plungers, said first plunger extending through one end of said insulating tubular member and the second plunger extending through the other end of said tubular member, an insulating cap mounted on the extending end of said second plunger, the first plunger constituting one terminal of a power takeoff, a coil rheostat mounted on the exterior of said last-named tubular member, one end of said rheostat coil extending through said last-named tubular member and electrically connected to said second plunger, a rheostat wheel rotatably mounted in said housing adjacent to said rheostat, an electrical contact on said wheel, said first conduit making electrical contact with said contact on said wheel, a rheostat wiper mounted on said wheel and making electrical contact with said contact on said wheel and said rheostat coil, said third electrical conduit electrically connected to said second electrical conduit and positioned adjacent to said cap, said second electrical conduit connected to a second power takeoff terminal.

3,885,212
SECTOR FLUX NULL CURRENT MEASURING APPARATUS AND METHOD

William L. Herbert, Columbus, Ohio, assignor to Halmar Electronics, Inc., Columbus, Ohio

Filed Apr. 5, 1973, Ser. No. 348,272
Int. Cl. G01r *19/00*, *33/06*
U.S. Cl. 324—117 H **5 Claims**



4. An apparatus for measuring current in a bus comprising, in combination:

a field-sensing element for sensing the field at one point in space and producing a signal having a magnitude proportional to the field which passes therethrough and produced by the current being measured, said field-sensing element being fixedly located in the field produced by the current being measured at a point where fields produced by other conducting buses are substantially perpendicular to the field produced by the current being measured;

a pair of unconnected non-annular field-concentrating members located on opposite sides of said field-sensing means for concentrating only a sector of the field produced by the current being measured;

an electrical conducting coil wound around said field-concentrating members, said coil surrounding said field-sensing element and field-concentrating members on both sides of said field-sensing element;

an amplifier means electrically responsive to said signal from said field-sensing element for producing an amplified signal at the output of said amplifier;

means for connecting said amplifier output to said coil to produce a field in said field-concentrating members in a direction opposite the field produced by the current being measured; and

means to measure said amplified signal, the magnitude thereof being proportional to the current being measured.

3,885,213
MEASURING PROBE FOR INTENSE AND VARIABLE ELECTRIC CURRENTS

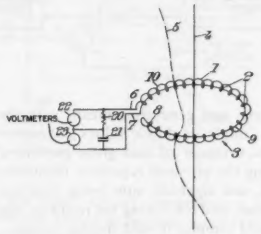
Françoise Rioux, and Christian Rioux, both of Cachan, France, assignors to Agence Nationale de Valorisation de la Recherche, Paris, France

Filed Jan. 9, 1973, Ser. No. 322,177

Claims priority, application France, Jan. 14, 1972, 72.01226

Int. Cl. G01r *1/22*

U.S. Cl. 324—127 **12 Claims**



1. Probe for measuring intense and variable electric currents in a conductor, said probe comprising a metallic wire coil having an insulating core and being arranged so as to form a plurality of turns of the same cross-section which are distributed regularly along an axis adapted to surround the conductor traversed by the variable current to be measured so that the variable current induces a measuring signal in said turns, said metallic wire coil comprising first and second end terminals, and a measuring impedance being directly arranged between said terminals, said measuring impedance comprises a resistor and a capacitor connected in series, a first volt meter means being connected across said resistor and a second volt meter means being connected across said capacitor, the value of the resistance of said metallic wire being at least ten times greater than the value of said measuring impedance.

3,885,214
MOVING COIL SYSTEM FOR LIGHT-BEAM GALVANOMETERS, LIGHT-BEAM OSCILLOGRAPHS AND THE LIKE

Gerd Kuligowski, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 27, 1973, Ser. No. 391,584

Claims priority, application Germany, Aug. 29, 1972, 2242957

Int. Cl. G01r *5/02, 1/00*

U.S. Cl. 324—154 R **3 Claims**

1. A moving coil system for a light-beam galvanometer, light-beam oscillograph and the like comprising a suspending element defining a longitudinal axis; a mirror securely attached to said suspending element; and, a single undivided rotating coil defining a window, said rotating coil being securely mounted on said suspending element in a position inclined with respect thereto so as to cause said suspending element to extend through said window to conjointly define an acute angle therewith and to cause the composite of said

suspending element and said rotating coil to be balanced with respect to said longitudinal axis.

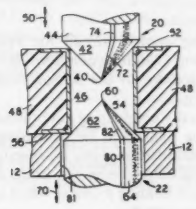
3,885,215
ELECTRODE ASSEMBLY FOR MEASURING THE EFFECTIVE THICKNESS OF THRU-HOLE PLATING IN CIRCUIT BOARD WORKPIECES OR THE LIKE

Jacques J. Weinstock, Flushing, N.Y., assignor to Unit Process Assemblies Inc., Syosset, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,396

Int. Cl. G01r *1/06, 27/14*

U.S. Cl. 324—158 P **5 Claims**



1. An electrode construction for use in apparatus for measuring the conductivity of a plated coating in a thru-hole in a circuit board workpiece,

a first electrode assembly compositely constituted of a first generally conically shaped electrode contact element of circumferential extent intermediate its apex and base sufficient to engage the principal portion of one of the defining marginal perimetric edges of a plated thru-hole in essentially line contact therewith and a second electrode contact element electrically isolated from said first electrode element and longitudinally extending intermediate the apex and base of said first conically shaped electrode element, said second electrode contact element having an exposed circumferential extent sufficient to engage substantially all of the remaining portion of said defining marginal perimetric edge of said plated thru-hole,

a second electrode assembly selectively disposed in longitudinal coalignment with the first electrode assembly and compositely constituted of a third generally conically shaped electrode contact element of circumferential extent intermediate its apex and base sufficient to engage the principal portion of the other defining marginal perimetric edge of said plated thru-hole in essentially line contact therewith and a fourth electrode contact element electrically isolated from said third electrode element and longitudinally extending intermediate the apex and base of said third conically shaped electrode element, said

fourth electrode contact element having an exposed circumferential extent sufficient to engage substantially all of the remaining portion of said other defining marginal perimetric edge of said plated thru-hole,

and means for selectively positioning said first and second electrode assemblies in electrically conductive relation with said defining marginal perimetric edges of a plated thruhole in a circuit board workpiece interposed therebetween.

3,885,216

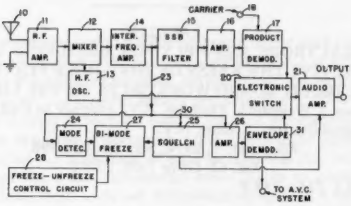
BIMODE COMMUNICATION SYSTEM WITH FREEZE CIRCUIT

Leonard R. Kahn, 70 N. Grove St., Freeport, N.Y. 11520

Filed Oct. 19, 1973, Ser. No. 407,891

Int. Cl. H04b *1/40*

U.S. Cl. 325—22 **7 Claims**



1. A switching control circuit for switching a transmit-receive circuit into a latching condition in one of two modulation modes responsive to the sensed mode of the received signal comprising:

a. a first normally conducting gate circuit for receiving the sensed mode signal and for delivering a signal when the amplitude modulation wave is sensed;

b. a storage capacitor connected to the first gate circuit for collecting and holding a charge when a signal is passed by the first gate circuit;

c. a comparison circuit coupled to the storage capacitor for comparing the voltage it produces with a reference voltage;

d. a second normally conducting gate connected to the comparison circuit for transmitting the sensed mode signal; and,

e. switching means including a bistable multivibrator coupled to the comparison circuit in series with the second gate circuit for latching the multivibrator into a conductance condition which applies a signal to the transmit-receive circuit to cause the transmit portion to operate in the mode of the received signal.

3,885,217

DATA TRANSMISSION SYSTEM

Roberto Cintron, Bronx, N.Y., assignor to Computer Specifics Corporation, New York, N.Y.

Filed July 11, 1973, Ser. No. 378,190

Int. Cl. H04l *9/00*

U.S. Cl. 325—26 **43 Claims**

1. A data transmission system for transmitting data in conjunction with a program source material signal comprising:

means for repetitively superposing the same data signal on the program source material signal to form a combined signal, said data signal being synchronous with a given frequency and having an amplitude level within the amplitude range of the ambient noise appearing in said program source material signal;

means for transmitting said combined signal;

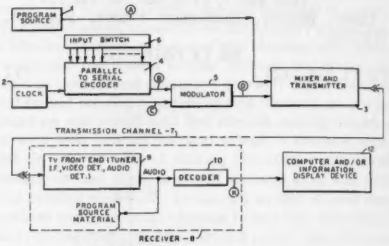
means for receiving and operating on said combined signal to extract said data signal from said combined signal, said receiving means comprising:

synchronous sampling means for amplitude sampling said combined signal in synchronism with the synchronous frequency of said data signal;

generating means coupled to said synchronous sampling means for generating signals corresponding to the amplitude values of respective samples of said data signal;

storage means;

arithmetic means coupled to said storage means and to said generating means for adding the amplitude value of a sample corresponding to a given portion of the data signal



received from said generating means with the algebraic sum of the sample amplitude values corresponding to the previous occurrences of said given portion of the data signal during the previous repetitive occurrences of said data signal, said algebraic sum being received from said storage means, and for storing the resulting algebraic sum values of said samples in said storage means;

means coupled to said storage means and responsive to said sum values of said data signal samples reaching a predetermined level for indicating the presence of valid data; and

output utilization means for generating a representation corresponding to said valid data.

3,885,218

SUPERHETERODYNE RECEIVER HAVING A DIGITAL INDICATION OF THE RECEIVED FREQUENCY

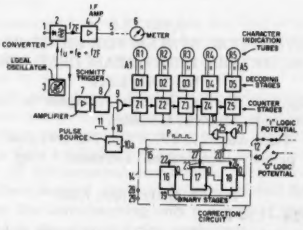
Diethard Pfab, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 6, 1973, Ser. No. 348,684

Claims priority, application Germany, Apr. 10, 1972, 2217210

Int. Cl. H04b *1/16;* **G01r** *23/10*

U.S. Cl. 325—455 **8 Claims**



7. A superheterodyne receiver which provides a digital indication of the receiving frequency by correcting the count of the local oscillator frequency to reflect the frequency offset of the local oscillator frequency with respect to the receiving frequency, said receiver comprising: a local oscillator; a multi-

stage counter; means connecting said oscillator and said multi-stage counter and deriving a pulse train from the oscillations of said oscillator for operating said counter; means connected to said multi-stage counter for decoding and displaying the count thereof; and a correction circuit connected to first and second stages of any two adjacent stages of said multi-stage counter and operable in response to the occurrence of the first output pulse of said first stage to provide a number of counting pulses which is proportional to the frequency offset to subsequent stages of said multi-stage counter.

3,885,219

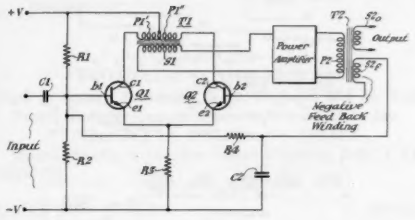
FAIL-SAFE ELECTRONIC AMPLIFYING CIRCUIT

Thomas C. Vaughn, Plum Borough, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Jan. 22, 1973, Ser. No. 325,651

Int. Cl. H03f *3/68*

U.S. Cl. 330—30 D **8 Claims**



1. An electronic circuit comprising, a first and a second transistor each having an emitter, a collector and a base electrode and interconnected as a differential amplifier, a source of a.c. signals applied to the input of said first transistor of said differential amplifier, said emitter electrodes of said transistors are coupled to a first source of biasing voltage by a common resistor, said collector electrodes of said transistors are coupled to a second source of biasing voltage by a transformer, said base electrodes of said transistors are respectively coupled to said a.c. signals and to negative feedback signals by impedance means, a difference signal derived from the output of said first and said second transistors of said differential amplifier and applied to the input of a power amplifier, a feedback circuit applying d.c. operating potential to said second transistor of said differential amplifier, and the output of said power amplifier supplies said negative feedback signals over said feedback circuit to the input of said second transistor of said differential amplifier and provides an a.c. output signal which is the maximum gain times the difference between said a.c. input signals and said negative feedback signal plus the gain of said power amplifier to a load when and only when each critical circuit or component is functioning properly in a safe manner.

3,885,220

BUFFERED MULTIPLEXER WITH DIFFERENTIAL AMPLIFIER

Dale A. Fluegal, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

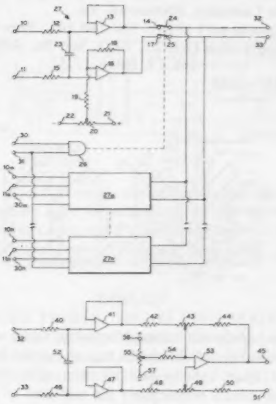
Filed Dec. 4, 1973, Ser. No. 421,508

Int. Cl. H03f *3/68;* **H03k** *17/00*

U.S. Cl. 330—30 R **5 Claims**

1. A multiplexer comprising:

an output circuit comprising first and second buffer amplifiers, first and second output terminals, a differential amplifier having first and second inputs and an output, means connecting the output of said differential amplifier to said first output terminal, a first potentiometer connected between the output of said first amplifier and said first output terminal, a second potentiometer connected between the output of said second amplifier and said second output terminal, and means connecting the first and second inputs of said differential amplifier to the contactors of said first and second potentiometers, respectively; and



a plurality of input circuits, each comprising first and second input terminals, third and fourth buffer amplifiers, means connecting said first input terminal to the input of said third amplifier and said second input terminal to the input of said fourth amplifier, and circuit means including switching means to connect the outputs of said third and fourth amplifiers selectively to the inputs of said first and second amplifiers, respectively, of said output circuit.

3,885,221

COUPLING ARRANGEMENTS IN RESONANT DEVICES

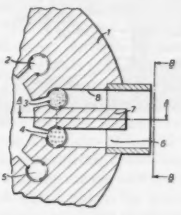
Peter Frederick Lewis, Chelmsford, England, assignor to English Electric Valve Company Limited, Chelmsford, Essex, England

Filed Sept. 13, 1973, Ser. No. 396,859

Claims priority, application United Kingdom, Mar. 2, 1973, 10337/73

Int. Cl. H01j *23/32, 23/20*

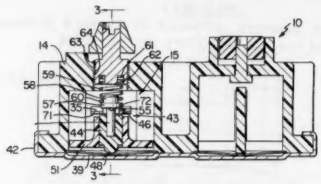
U.S. Cl. 333—83 R **10 Claims**



1. A resonant device having a plurality of resonant cavities in a common block at least two adjacent ones of which exhibit in operation magnetic fields of opposing phase, and a co-axial transmission line formed by an annular hole of at least substantially constant cross-sectional dimensions throughout its length extending into said block only to such depth that a portion only of the annular hole to one side of the inner wall forming member breaks into one of said two cavities and a portion only of the annular hole to the opposite side of said inner wall forming member breaks into the other of said two cavities to effect coupling to or from said device while leaving

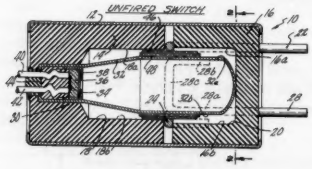
said inner wall forming member integrally joined with said block.

3,885,222
THERMOSTAT CONSTRUCTION
Siegfried E. Manecke, Indiana, Pa., assignor to Robertshaw Controls Company, Richmond, Va.
Continuation-in-part of Ser. No. 260,107, June 6, 1972. This application Oct. 23, 1973, Ser. No. 408,678
Int. Cl. H01h *37/52*
U.S. Cl. 337—338 **20 Claims**



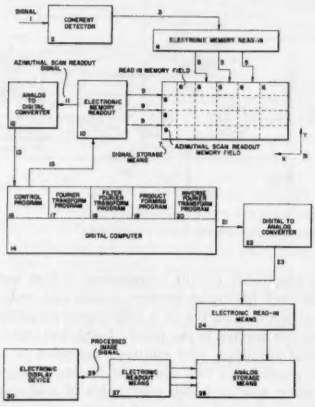
1. A control device having a housing, a pair of thermostatically operated electrical switch means carried by said housing in spaced apart side-by-side relation, said housing having external terminals respectively for said pair of switch means, and a rigid lead means carried internally in said housing and electrically interconnecting said pair of switch means in series, said rigid lead means having opposed ends and being secured to said housing intermediate said ends thereof to dispose said ends in cantilever fashion with said ends respectively forming part of said switch means.

3,885,223
EXPLOSIVELY OPERATED MULTI-CIRCUIT BAND SWITCH INCLUDING FLEXIABLE DIAPHRAGM BAG CONTACT
Alan N. Green, Cochranville, Pa., assignor to Colt Industries Operating Corp., Hartford, Conn.
Filed Apr. 11, 1974, Ser. No. 460,016
Int. Cl. H01h *37/76;* **F42b** *5/08*
U.S. Cl. 337—406 **4 Claims**



1. A switch comprising:
a housing having a cavity therein;
a tube mounted in the housing so as to be positioned within the cavity, the tube having a collapsed portion in the cavity with an oblong transverse cross section and diametrically opposed ridges extending in the direction of the tube's axis;
at least one band, made of an electrically conductive material, at least partially encircling the collapsed portion of the tube transverse to the tube's axis;
a pair of diametrically opposed electrical contact members mounted in the housing so as to protrude into the cavity in respective contact with the band adjacent the ridges; and
means to inflate the tube for causing the collapsed portion to assume a cylindrical shape, whereby the band will radially withdraw from and disconnect the contact members.

3,885,224
SIGNAL PROCESSING APPARATUS FOR IMAGING SCANNER
Carl N. Klahr, Lawrence, N.Y.
Continuation-in-part of Ser. No. 228,805, Feb. 24, 1972, Pat. No. 3,805,596. This application Sept. 13, 1973, Ser. No. 396,774
Int. Cl. G01s *9/66*
U.S. Cl. 340—5 MP **18 Claims**



1. An ultrasonic imaging scanner wherein a reflecting body in an ultrasonic propagation medium is scanned along a predetermined path or aperture by ultrasonic pulses to produce a processed image signal time function for high resolution imaging of said reflecting body with specified azimuthal resolved width, comprising in combination
a. at least one ultrasonic sensing transducer whose width in the azimuthal direction is less than the specified azimuthal resolved width
b. means for replication of said ultrasonic sensing transducer at a sequence of positions across said aperture, wherein the aperture length measured in units of the ultrasonic wavelength, must exceed the ratio of the maximum range of said reflecting body, to the specified azimuthal resolved width
c. at least one ultrasonic radiation transducer
d. means for successively pulsing said ultrasonic transducer wherein successive pulses have a determined phase relation to one another
e. means for detection of a sequence of ultrasonic pulse signal time functions, back reflected from said reflecting body and incident at said replicated sequence of sensing transducer positions, wherein the phase of said reflected pulse functions is preserved by said detection means
f. means for storage of said detected sequence of reflected ultrasonic pulse signal time functions in a doubly indexed memory array indexed by pulse transit time in one indexing dimension and by the sensing transducer position in the other indexing dimension
g. means for reading back said stored signal time function values in transposed order as a sequence of sets indexed by pulse transit time, wherein each set of signal ampli-

tudes is arranged in serial order according to the sensing transducer azimuthal position coordinate

h. means for mathematical processing of said sequence of sets indexed by pulse transit time, by convolution calculation of said sequence of azimuthal position-dependent sets of reflected signal amplitudes with a prescribed filter function which is mathematically inverse to the filter function characterising a unit amplitude reflecting point return signal from said radiation transducer to said replicated sensing transducer positions in said ultrasonic propagation medium; said means including means for producing the fourier transform of the azimuthal position-dependent variation of each said set at each range corresponding to each pulse transit time, means for generating a fourier transform signal of said prescribed filter function at each range, means for forming the product function of said fourier transforms, and means for inverse fourier analysis of said product function at each range, said inverse fourier analysed function comprising said processed image signal time function for high resolution imaging.

3,885,225

BROAD LINE SEISMIC PROFILING

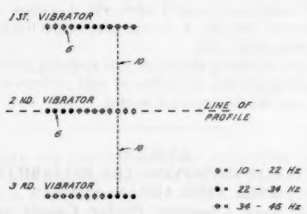
Nigel A. Anstey, Sevenoaks, Kent, England, and M. Turhan Taner, Houston, Tex., assignors to Seiscom Delta Inc.

Filed July 19, 1973, Ser. No. 380,682

Claims priority, application United Kingdom, July 21, 1972, 34164/72

Int. Cl. G01v *1/22*

U.S. Cl. 340—15.5 CP **28 Claims**



1. A method of obtaining cross-dip information in seismic reflection profiling by the simultaneous radiation, from a plurality of points spaced at different distances from the line of profile, of swept frequency seismic signals from each of the spaced points differing in frequency from the seismic signals of the other spaced points so that the signals, after transmission and reception along different laterally spaced travel paths, may be identified as to their particular sources and travel paths on the basis of a frequency discrimination so that the signals can be processed to obtain cross dip information.

3,885,226

AIRCRAFT MULTIPLE ANTICOLLISON LIGHT SYSTEM

William J. Lang, New Port Beach; Gerald K. Brewer, Anaheim; Richard B. Fritz, Laguna Hills, and Frederick W. Eggers, Huntington Beach, all of Calif., assignors to Symbolic Displays, Inc., Irvine, Calif.

Filed Oct. 15, 1973, Ser. No. 406,592

Int. Cl. G08g *5/00*

U.S. Cl. 340—27 R **20 Claims**

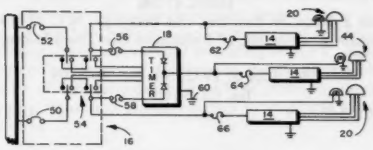
1. Apparatus for providing a warning light system to an aircraft having electrical power, comprising:

at least one position indicator light and high intensity light mounted on the aircraft;

wires internally located within said aircraft leading to the respective wing tip areas for electrical connection to the position indicator lights and the high intensity light;

means connected to said wires to generate a signal of a pre-established frequency thereon;

means to connect said wires to the power of the aircraft for powering said position indicator lights and said high intensity lights while said pre-established frequency signal is being generated; and,



frequency detection means connected to said wires and said high intensity light for responding to said signal which is generated to cause said high intensity light to be lit at the same time said position indicator light is lit.

3,885,227

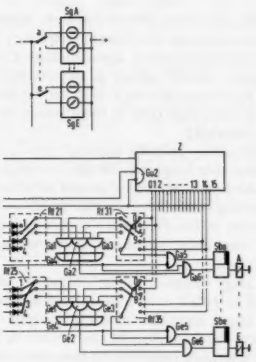
STREET TRAFFIC SIGNALLING SYSTEM

Friedrich-Gerhard Moissl, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 20, 1972, Ser. No. 245,791

Int. Cl. G08g *1/07*

U.S. Cl. 340—41 R **16 Claims**



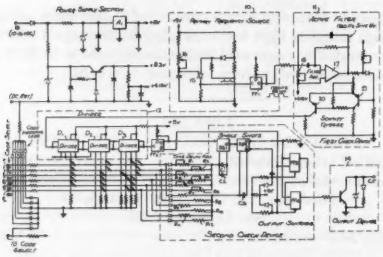
1. A street traffic signalling system having a plurality of mutually independently selectable signal phases for traffic control at an intersection, particularly a traffic-dependent selection, comprising a plurality of traffic signal units, each for a respective traffic direction, means for each signal unit for actuating respective signal lights thereof to provide the respective desired phases therefor, timing means having a plurality of timing outputs, a plurality of logical linkages for each selectable signal phase, operatively connecting predetermined timing outputs of said timing means with the cooperable actuating means for such signal phase, for providing respective protective periods prior to actuation of the go light associated therewith, phase-responsive switch means for each respective selectable phase, operative upon selection of such phase to determine the go light thereof to be actuated, and to initiate termination of the signal phase immediately preceding such new phase, and second phase responsive switch means for each respective selectable phase, operatively connected to logical linkages of other signal phases for effecting a selection of the timing outputs and connecting linkages therefor associated with such other signal phases, in the event of a transition from the associated phase to a new phase, whereby a predetermined time period is provided between termination of such immediately preceding signal phase and actuation of the se-

lected go light of the new phase, in dependence upon the said immediately preceding phase so terminated.

3,885,228
FAIL-SAFE ELECTRONIC ENCODER FOR SELECTIVELY OPERATING RAILWAY SIGNAL INDICATOR

Martin J. Katz, 30 East Dr., Old Bethpage, N.Y. 11714, and William A. Gesualdi, 17 Smithtown Cres., Smithtown, N.Y. 11787

Filed June 5, 1973, Ser. No. 367,109
Int. Cl. B61l *7/08*
U.S. Cl. 340—47 **10 Claims**



1. A fail-safe electronic encoder system adapted to selectively produce code tones of different frequency for operating a frequency-responsive railway signal indicator, said indicator displaying signals whose aspect is determined by the frequency of the applied code tone except for the most restrictive aspect which is presented only in the absence of a code tone, said system comprising:

A. a high-frequency primary source;

B. a programmable frequency divider coupled to the output of said source and including means to select one of several operating ratios whereby the divider yields any one of a plurality of low-frequency code tones each having a different frequency, said code tones having normal frequency values;

C. a drive stage coupled to the output of said divider to supply the selected code tone to said indicator, and

D. fail-safe check means to inhibit the output of said system in the event the frequency of said source deviates beyond a narrow tolerance range or the frequency or the selected code tone yielded by said divider departs from its normal value, whereby no code tone is supplied to said indicator in either event, said fail-safe check means yielding an output only if the input thereto is correct and the check means is functioning properly, the output being inhibited in the event of an incorrect input to the check means or a malfunction of the check means.

3,885,229
DOCUMENT SCANNING APPARATUS

Michihiko Negita, and Yoshiyasu Kikuchi, both of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

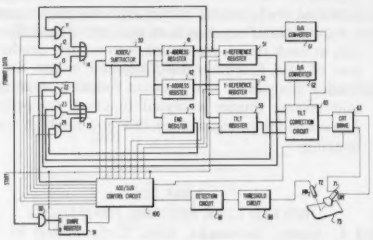
Filed Oct. 25, 1973, Ser. No. 409,540
Claims priority, application Japan, Oct. 28, 1972, 47-108189; Oct. 28, 1972, 47-108190
Int. Cl. G06k *9/04*
U.S. Cl. 340—146.3 H **7 Claims**

1. A document scanning apparatus comprising:

means for receiving control data such as positional data including a scanning position coordinate used for scanning information on a document, and storing the control data as present positional data for scanning the document, said means for storing the control data including an X-address register and a Y-address register for storing X and Y coordinate positional data;

means for scanning information on the document according to said present positional data;

arithmetic means responsive to said means for scanning for periodically adding or subtracting a fixed quantity from the contents of said X-address register until the X-coordinate of said reference mark is detected and for periodically adding or subtracting a fixed quantity from the contents of said Y-address register until the Y-coordinate of said reference mark is detected;



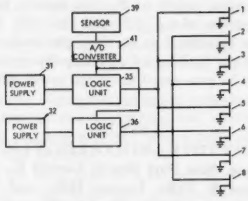
means for storing as a detected positional data the present positional data used when the reference mark is detected, said means for storing the detected positional data including an X-reference register and a Y-reference register for storing X and Y present coordinate positional data, said data being transferred into said X-reference register and said Y-reference register upon the detection of the X-coordinate and the Y-coordinate, respectively, of said reference mark; and

means for correcting the document stopping position error depending on the detection of said reference mark to carry out the document scanning.

3,885,230
SYSTEM FOR IMPROVING THE RELIABILITY OF INDICATOR ARRANGEMENTS

Paul Joseph Merk, Chomedey, Quebec, Canada, assignor to Canadian Marconi Company, Montreal, Quebec, Canada

Filed May 24, 1973, Ser. No. 363,555
Int. Cl. H04q *1/28*
U.S. Cl. 340—166 EL **9 Claims**



1. A system for improving the reliability of indicators;

each indicator comprising an illuminable path;

each illuminable path comprising a series of light sources sequentially arranged and adapted to be turned on and off in sequence;

said system comprising;

a plurality of n separate power supplies for continuously energizing said light sources;

the number of light sources in each series being greater than *n;*

the 1st, 2nd, 3rd, . . . *n*th power supplies being respectively adapted to energize the 1st, 2nd, 3rd . . . *n*th sources in each series;

the 1st power supply being further adapted to energize the *n*+1st, 2*n*+1st, 3*n*+1st . . . sources in each series;

the 2nd power supply being further adapted to energize the *n*+2nd, 2*n*+2nd, 3*n*+2nd . . . sources in each series;

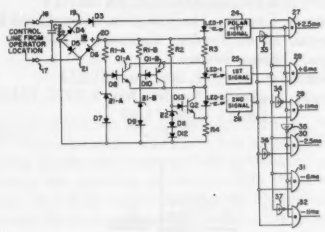
the 3rd power supply being further adapted to energize the *n*+3rd, 2*n*+3rd, 3*n*+3rd . . . sources in each series;

the *n*th power supply being further adapted to energize the 2*n*th, 3*n*th, 4*n*th . . . sources in each series.

3,885,231
REMOTE CONTROL CIRCUIT HAVING LIGHT COUPLING

Thomas W. Gaddy, Florence, S.C., and Larry H. Wohlford, Rustburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Oct. 19, 1973, Ser. No. 407,905
Int. Cl. H03k *17/60*
U.S. Cl. 340—172 **7 Claims**



1. An improved control circuit for responding to a direct current of selected magnitude and polarity applied to a control line from a remote operator location, said improved control circuit comprising:

a. first and second input terminals adapted to be connected to said line;

b. a rectifier bridge having input terminals connected to said first and second input terminals and having positive and negative output terminals;

c. a first current responsive, light producing device connected between one of said bridge input terminals and one of said bridge output terminals for producing light in response to current flow of a selected polarity;

d. a first resistor having one end connected to said positive bridge output terminal;

e. a second current responsive, light producing device having one end connected to the other end of said first resistor;

f. a second resistor connected between the other end of said second light producing device and said negative bridge output terminal;

g. a first transistor having an emitter, a base, and a collector;

h. means connecting said transistor emitter and collector respectively to said ends of said second light producing device;

i. a first reference circuit connected between said positive and negative bridge output terminals for providing a reference voltage;

j. means connected between a point of said reference circuit and said transistor base for causing said transistor to have a first conductive state in response to current at said bridge output terminals below a selected magnitude, and for causing said transistor to have a second conductive state in response to current at said bridge output terminals above said selected magnitude;

k. said second light producing device having first and second states depending upon the conductive state of said transistor;

l. a first light sensitive device positioned in operative relation to said first light producing device for producing control signals in response to the presence and absence of light from said first light producing device;

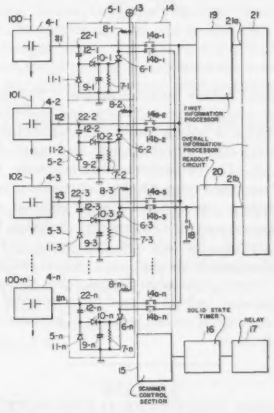
m. a second light sensitive device positioned in operative relation to said second light producing device for producing control signals in response to the presence and absence of light from said second light producing device;

n. and a utilization circuit coupled to said light sensitive devices.

3,885,232
APPARATUS FOR THE TREATMENT OF YARN THICKNESS VARIATION SIGNALS

Tsugio Goto, Nobeoka, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 22, 1973, Ser. No. 343,980
Claims priority, application Japan, Mar. 24, 1972, 47-29893
Int. Cl. G11c *11/24*; **G06h** *3/05*
U.S. Cl. 340—173 R **4 Claims**



1. An apparatus for processing defect signals from a plurality of yarns wherein said signals may be applied to a digital processor, said apparatus comprising:

a. a plurality of sensor means, each sensor means associated with one of said yarns for detecting a defect in said yarns;

b. a plurality of memory means, each of said memory means coupled to a corresponding one of said sensor means for storing a defect signal produced by its corresponding sensor means;

c. scanner means coupled to said plurality of memory means for cyclically sequentially sampling the signals stored in said memory means for subseqeunt output to said digital processor; and

d. reset means for periodically resetting said memory means at the beginning of each sampling cycle; wherein each said memory means includes

a thyristor, the anode thereof being coupled to said scanner means;

a capacitor having one electrode connected to its corresponding sensor means;

diode means coupled between the other electrode of said capacitor and the gate electrode of said thyristor, wherein said sensor means applies a pulse to the gate

of said thyristor through said capacitor and diode means, turning said thyristor on and thereby changing the potential on the anode thereof when a defect signal is sensed by said sensor means; wherein said thyristor remains on until reset by said reset means.

3,885,233

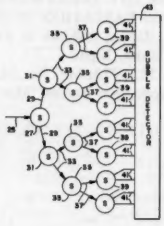
BUBBLE DETECTION SYSTEMS AND MULTIPLIERS USED THEREIN

Robert C. Minnick, Houston, Tex.; Paul T. Bailey, Creve Coeur; Robert M. Sandfort, St. Charles, both of Mo., and Warren L. Semon, Dewitt, N.Y., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 283,267, Aug. 24, 1972. This application Mar. 8, 1974, Ser. No. 449,500

Int. Cl. G11c *11/14*

U.S. Cl. 340—174 ZA **11 Claims**



1. A magnetic bubble readout system comprising a field accessed input channel for receiving and transmitting magnetic data bubbles, a bubble multiplier connected to receive magnetic bubbles transmitted through said input channel and producing a plurality of simultaneous magnetic bubbles on different field accessed output bubble channels in responses to each data bubble received on said input channel, and bubble detection means connected to receive bubbles transmitted through said output channels and responsive to the bubbles received simultaneously through each of said output channels to generate a signal indication representing the presence or absence of each data bubble on said input channel and having a signal level dependent on the number of bubbles detected on said output channels.

3,885,234

ULTRASONIC WAVE TYPE ALARM DEVICE FOR DEPICTING A MOVING OBJECT

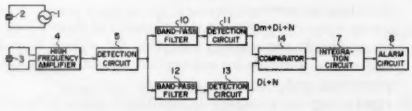
Yukio Fujimoto, Yachiyo, Japan, assignor to Uro Electronics Industries Co., Ltd., Tokyo-to, Japan

Filed Mar. 13, 1973, Ser. No. 340,743

Claims priority, application Japan, Mar. 17, 1972, 47-32111

Int. Cl. G08b *13/18*

U.S. Cl. 340—258 A **3 Claims**



1. In an alarm apparatus wherein an ultrasonic wave is transmitted through the air and reflected by a moving person to create a Doppler effect signal falling within a given range of frequencies corresponding to the Doppler effect signal components of a moving person, and wherein an alarm is normally triggered in response to the presence of a received Doppler effect signal falling within said given range of frequencies, the improvement enabling said apparatus to reject (1) received Doppler effect signals caused by noise and having frequency components falling both within and beyond said given range of frequencies, and (2) received Doppler effect signals caused by an object other than a moving person and having frequency components substantially co-extensive with said first range of frequencies, said improvement comprising:

a first band-pass filter means operable upon a received Doppler effect signal for passing only a first band of relatively low frequency components within said given frequency range corresponding to the Doppler effect signal components of a person moving at a speed of approximately .4 to 1 meters per second;

a second band-pass filter means operable upon a received Doppler effect signal for passing a second band of frequency components different than and relatively higher than said first band and falling within said given frequency range;

means responsive to the difference between the outputs of said first and second band-pass filters for generating a difference signal representative thereof; and

means responsive to said difference signal for triggering an alarm.

3,885,235

RESETTABLE TIMER-ALARM DEVICE USED IN MONITORING GERIATRIC PATIENTS

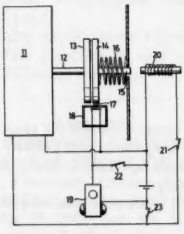
Sten R. Bergstrom, Uppsala; Ake Dahlgren, Lidingo, and Kjell Roos, Uppsala, all of Sweden, assignors to Konsult AB Gerontologia, Lidingo, Sweden

Filed Feb. 9, 1973, Ser. No. 331,253

Claims priority, application Sweden, June 5, 1972, 7323/72

Int. Cl. G08b *21/00*

U.S. Cl. 340—279 **7 Claims**



1. A device for use in geriatrics, medical care, and the like for the emission of a signal, for instance when a person not under continuous surveillance, hereinafter referred to as the patient, has suffered a reduction in his normal functional capabilities, for instance his mobility, comprising:

a. a timing device for continuous operation through a time cycle of a predetermined length,

b. an alarm device operatively connected with said timing device,

c. means releasably coupled to said timing device and having an initial position, for triggering an alarm by the alarm device at the end of said length of time,

d. a plurality of switch means for releasing the coupling of said triggering means to said timing device,

e. means for restoring the coupling between the triggering means and the timing device, including means for automatically resetting the triggering means into the initial position,

f. each of said switch means being connected to an object in the surroundings of the patient, said object being in daily routine use by the patient, and said switch means being unattached to the person of said patient, and

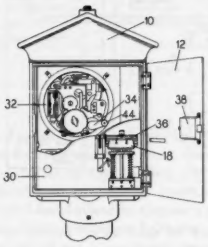
g. wherein said device is used for surveillance, for instance during the night, of industries, military installations or

other installations where a watchman checks certain points along his patrol route, wherein each point comprises said switch means connected to the timing device in parallel, causing the triggering means to return to the initial position when the watchman performs the checking operation.

3,885,236
FIRE ALARM BOX

Robert Bruce McNair, 42 Hayward Ave., and Raymond J. Gallagher, 731 Oregon Ave., both of San Mateo, Calif. 94401

Filed Oct. 2, 1973, Ser. No. 402,873
Int. Cl. G08b *25/00*
U.S. Cl. 340—304 **5 Claims**



1. In an alarm box for signaling an alarm at a fire station or other remote location, said alarm box having a lever actuated signaling mechanism enclosed within the box, an inner door enclosing the signaling mechanism with the lever projecting through said inner door, and a generally locked outer door enclosing the lever, means for actuating the lever which comprises:

a card having a preselected magnetic pattern formed therein;

a slot formed through the outer door and adapted to allow passage of the card through said outer door;

a magnetic lock interior to the outer door and projecting through the inner door, said lock having a card receptacle designed to be solely fully engageable by the card having the preselected magnetic pattern;

means for actuating the lever to activate the signaling mechanism responsive to fully engagement of the card receptacle by the card; and

means for capturing the card upon full engagement of the card receptacle, said capture means being manually operable to release the captured card, said capture means located within the outer door to necessitate unlocking and opening of said outer door to manually release said card.

3,885,237
PHASED ARRAY SEQUENTIAL SWITCHING BETWEEN SHORT AND LONG DISTANCE TARGETS

George M. Kirkpatrick, 202 David Dr., Syracuse, N.Y. 13212

Division of Ser. No. 167,134, July 29, 1971, Pat. No. 3,781,878. This application Dec. 26, 1973, Ser. No. 427,684
Int. Cl. G01s *9/02*
U.S. Cl. 343—5 W **5 Claims**

1. A phased array radar system carried aloft by aircraft for detecting long range and short range elevated targets, while suppressing ground clutter, the system comprising:

a phased array antenna;

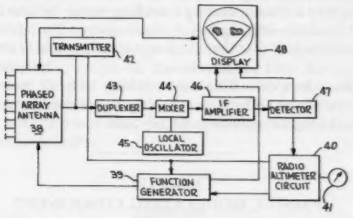
transmitter means having its output connected to the antenna for radiating a beam outwardly;

function generating means having first input connected to altimeter means, the generating means being provided for generating a beam steering signal to the antenna, dependent upon the altitude of the antenna;

an output of the generating means connected to a second input of the antenna for steering the transmitted beam between at least two elevational angles, namely, a high beam and a low beam;

receiving means connected to the output of the antenna for processing an incoming signal;

recording means connected to the output of the receiving means for recording the processed signal;



means connecting a second output of the function generating means to the recording means for blanking noise and signals, at relatively long range from a signal fed to the recording means from the receiving means, while the antenna transmits and receives on the high beam;

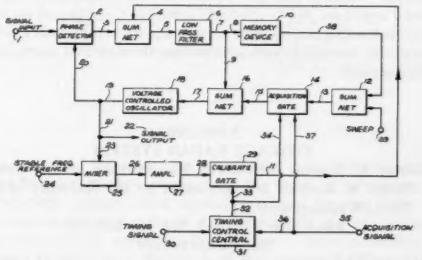
the function generating means further sequentially blanking the short range ground return from the recording means while the antenna transmits and receives on the low beam; and

whereby the sequential blanking prevents recording of false targets.

3,885,238
PHASE LOCKED LOOP RECEIVING SYSTEM WITH IMPROVED SIGNAL ACQUISITION

Albert M. Klein, Chatsworth, and Masaaki Fujita, Los Angeles, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 24, 1969, Ser. No. 879,414
Int. Cl. G01s *7/40, 9/02*
U.S. Cl. 343—7 A **5 Claims**



1. In a phase-locked loop receiving system having a tracking mode of operation for tracking a variable frequency received signal including an analog signal-controlled oscillator, means for comparing the phase of received signals with the phase of the output of said controlled oscillator to generate a first error signal, and means responsive to said first error signal for generating and applying a tuning signal which is a function of said first error signal to said controlled oscillator to form a closed tracking loop, the combination comprising:

a reference frequency source operating at a predetermined reference frequency within the range of expected fre-

quency variation of said variable frequency received signal;

means for comparing said reference frequency with said output of said signal-controlled oscillator to produce a second error signal;

switching means arranged to substitute said second error signal in place of said first error signal to generate said tuning signal during a first predetermined time interval, thereby to establish a calibrating mode of operation;

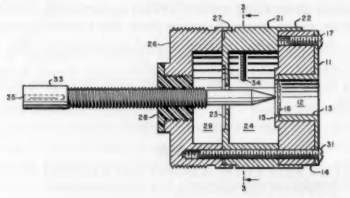
a periodic wave generator and means for superimposing the output of said periodic wave generator on said tuning signal beginning at the outset of a second time interval to initiate a corresponding searching mode of operation;

and second switching means responsive to a predetermined condition of said first error signal during said second time interval, said predetermined condition corresponding to phase lock-on within said tracking loop, to remove said periodic wave from said tuning signal thereby to permit said loop to operate in phase lock.

3,885,239
PASSIVE MODULATING COMPONENT

John F. Zaleski, Pleasantville, N.Y., assignor to The Singer Company, Little Falls, N.J.

Filed Aug. 19, 1960, Ser. No. 50,805
Int. Cl. G01s *9/02*
U.S. Cl. 343—7.6 **12 Claims**



1. A passive modulating component comprising, a hollow conductive body, the interior surface of said body defining a cavity in the shape of a figure of revolution, a flexible conductive diaphragm mounted to constitute a portion of said body and positioned on the axis of said figure, a conductive septum perpendicular to said axis fastened to said body and having an axial aperture, and a conductive member positioned on said axis extending through but insulated from said body at a point opposite said diaphragm, and passing through said aperture in said septum.

3,885,240
STORAGE RADAR SYSTEM

Garold K. Jensen, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 27, 1967, Ser. No. 649,791
Int. Cl. G01s *9/44*
U.S. Cl. 343—9 **11 Claims**

1. In a moving target detection apparatus, a system for storing a sequence of pulses whose amplitudes vary with the doppler information derived from the moving target, said system comprising:

a plurality of stationary storage elements equal in number to the number of pulses to be stored,

write-in means for sequentially gating in said sequence of pulses to be individually stored in said plurality of storage elements, said write-in means comprising a matrix of gating lines requiring simultaneous gating inputs on at least two of said lines to write into a given storage element, and

read-out means for sequentially reading out said stored pulses.

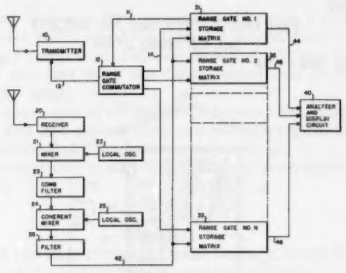
11. A phase-coherent pulse-doppler radar system comprising:

means to transmit a coherent, pulse r-f signal;

means to receive a doppler shifted pulse echo of said originally transmitted pulse signal;

means to mix said echo signal with an unshifted local signal to produce video pulse signals whose amplitudes vary with the doppler frequency;

a plurality of stationary storage elements equal in number



to the number of said video pulses to be stored and inter-connected to form a preselected number of groups equal in number to the number of ranges to be sampled;

write-in means for gating information into a selected number of said elements of each of said groups during each interpulse period;

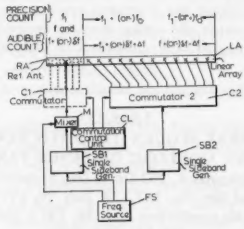
read-out means for gating out information stored in each of said groups separately and successively; and

means to analyze said read-out pulses to determine radial velocity and acceleration of a target detected.

3,885,241
DOPPLER RADIO NAVIGATION BEACON SYSTEM ADAPTED FOR ANGLE DETERMINATION USING UNMODIFIED COMMUNICATION RECEIVER

Francis Giles Overbury, Cuffley, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 14, 1973, Ser. No. 415,809
Claims priority, application United Kingdom, Nov. 16, 1972, 528861/72
Int. Cl. G01s *1/38*
U.S. Cl. 343—106 D **9 Claims**



4. A radio navigation beacon comprising:

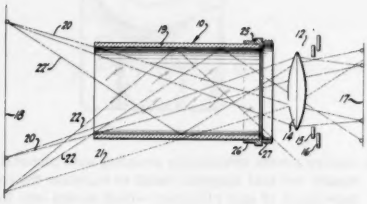
first means for radiating radio-frequency energy of a first frequency and a second frequency differing from said first frequency by δf where δf is an audio frequency;

and second means for simulating constant velocity linear scanning motion of a radiating source of radio-frequency energy of a third frequency differing from said second frequency by Δf, where Δf is a sub-audio frequency.

3,885,242
METHOD OF AND APPARATUS FOR PRODUCING PHOTOGRAPHIC VIGNETTES

Jack Duran, 25226 Soto Rd., Hayward, Calif. 94544

Filed Nov. 12, 1973, Ser. No. 414,663
Int. Cl. G03b *11/06*
U.S. Cl. 354—296 **12 Claims**

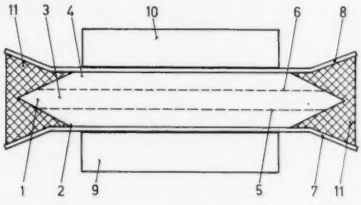


1. A method of taking photographic vignettes with a camera having an image-forming aperture and a focal plane, comprising the steps of: focusing the camera on a subject so that incident light therefrom enters said aperture and is directed thereby toward said focal plane to expose a photographic film disposed thereat; dividing incident light traveling directly from the vicinity of such subject toward said aperture into primary and secondary fields; concurrently refracting and reflecting the incident light forming said secondary field prior to its reaching said aperture to change the original character of the incident light forming said secondary field; and producing a vignette-type background generally about the subject on a photographic film disposed along the focal plane of such camera by directing said secondary field to the focal plane of such camera.

3,885,243
SEMICONDUCTOR DEVICE

Erich Weisshaar; Dieter Spickenbreuther, both of Baden, and Bernd Sitte, Magenwil, all of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Continuation-in-part of Ser. No. 265,521, June 23, 1972, abandoned. This application Sept. 24, 1973, Ser. No. 399,738
Claims priority, application Switzerland, June 25, 1971, 9331/71
Int. Cl. H01l *3/00, 5/00*
U.S. Cl. 357—79 **15 Claims**



1. A semiconductor device comprising:

a pair of semiconductor diodes connected in series opposition, said diodes formed in a single monocrystalline silicon semiconductor wafer having three layers of alternating conductivity types including an inner layer and a pair of outer layers, said semiconductor wafer bevelled around its periphery on both sides thereof, and having non-metalized end surfaces, wherein said end surfaces of said semiconductor wafer have an edge doping concentration of at least 10^{19} atoms/cm^3, said wafer has a doping gradient at its end surfaces such that the doping concentration at a depth of 35 microns is greater than 10^{16} atoms/cm^3, the doping concentration of said inner layer is less than 10^{17} atoms/cm^3, preferably less than 10^{16} atoms/cm^3, and the thickness of said outer layers of said semiconductor device is less than 100 microns;

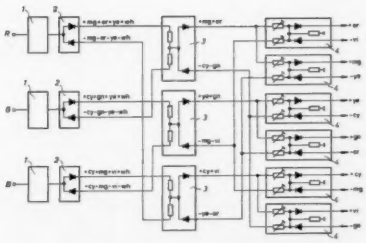
a pressure contact structure juxtaposed to each face of said semiconductor wafer, each pressure contact structure including a thin, dish-shaped element of a highly ductile and highly conductive metal one side of which engages one of said non-metalized end surfaces of said semiconductor wafer, and a thicker, disk-shaped conductive element abutting the exposed side of each dish-shaped element; and,

a band of flexible insulative material surrounding the periphery of said semiconductor wafer, said insulative material adhering said thin, dish-shaped elements to said semiconductor wafer.

3,885,244
METHOD OF PRODUCING COLOR CORRECTION SIGNALS AND COLOR SEPARATION SIGNALS

Hans Keller, Kiel-Wik, Germany, assignor to Dr. Ing. Rudolf Hell, Germany

Continuation of Ser. No. 99,011, Dec. 17, 1970, abandoned, which is a continuation-in-part of Ser. No. 744,720, July 15, 1968, abandoned. This application Sept. 17, 1973, Ser. No. 398,197
Int. Cl. H04n *1/46*
U.S. Cl. 358—80 **7 Claims**



1. A method for producing at least one color signal useful in multi-color printing, comprising the steps of generating trichromatic primary color separation signals, forming difference signals between pairs of the trichromatic primary color separation signals, separating the difference signals according to their polarity such that each of the separated difference signals predominantly represents two of the six basic colors of the color space to thereby produce partial signals, inverting the partial signals to form inverted partial signals with the same amplitude but of opposite polarity from the existing partial signals, selecting a pair of signals from said partial signals and said inverted partial signals which in part represent the same basic color with the same polarity, and comparing the amplitudes of the signals within the selected pair to select the signal having the smaller amplitude of the pair, which signal substantially represents a single basic color useful in multi-color printing.

3,885,245

SCANNING DEVICE

Mitsuo Nakatani, Gibu, Japan, assignor to Sanyo Electric Company, Ltd., Osaka, Japan

Filed Sept. 11, 1972, Ser. No. 287,610

Claims priority, application Japan, Sept. 14, 1971, 46-72326; May 12, 1972, 47-47426

Int. Cl. G11b *21/02, 5/82*

U.S. Cl. 360—101 **20 Claims**

1. A scanning device for a magnetic recording or reproducing apparatus comprising:

a. a support member,

b. a rotary disc rotatably mounted on said support member,

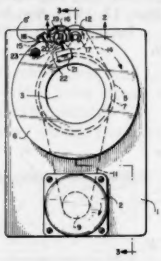
c. a motor means mounted on said support means for driving said rotary disc,

d. a radially-movable magnetic head mounted on said rotary disc,

e. an engaging member, fixedly attached to said support member, said support member having a circular surface with a center coinciding with the center of rotation of said rotary disc,

f. a planetary wheel means rotatably mounted on said rotary disc,

g. connecting means operatively coupling said engaging member and said planetary wheel means for rotating said planetary wheel means about its axis upon the rotation of said rotary disc, and



h. motive means operatively coupling said planetary wheel means and said magnetic head to translate the rotational movement of said planetary wheel means into the radial movement of said magnetic head, whereby the locus of movement of said magnetic head is a spiral.

DESIGN PATENTS

GRANTED MAY 20, 1975

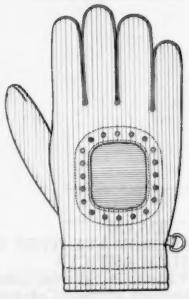
ERRATA

For CLASS	See PATENT NO.
D019-064	235,146

DESIGNS

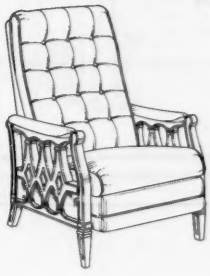
MAY 20, 1975

235,118
GLOVE
Warren L. Andrews, Chicago, Ill., assignor to Wells Lamont Corporation, Chicago, Ill.
Continuation-in-part of abandoned design application Ser. No. 361,789, May 18, 1973. This application Feb. 19, 1974, Ser. No. 443,705
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—276

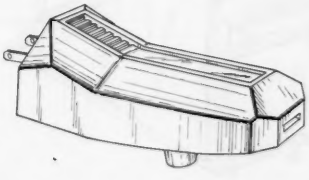


235,119
COMBINATION BRUSH, SCRAPER AND WIPER
Delbert R. Gode, 1200 W. Burnsville Crosstown, Burnsville, Minn.
Filed Nov. 8, 1973, Ser. No. 414,528
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—6

235,120
CHAIR
George Mergenov, Closter, N.J., assignor to Mohasco Corporation, Amsterdam, N.Y.
Filed Sept. 18, 1973, Ser. No. 398,498
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—68

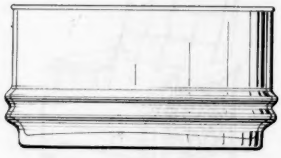


235,121
SHAVING LATHER HEATER AND DISPENSER
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.
Filed Aug. 5, 1974, Ser. No. 494,487
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D6—95

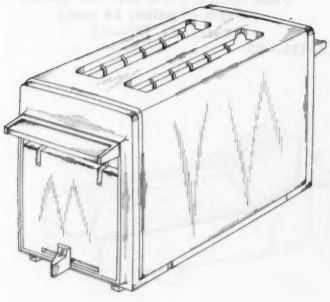


235,122
FOOD STORAGE CONTAINER
Joseph R. Neri, Brooklyn, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Aug. 16, 1973, Ser. No. 388,874
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—23

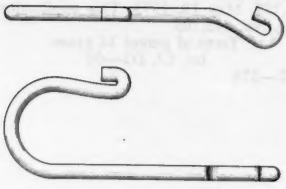
235,123
CANISTER OR SIMILAR ARTICLE
Walter B. Achenbach, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Oct. 23, 1973, Ser. No. 408,826
Term of patent 14 years
Int. Cl. D9—*02;* D7—*07*
U.S. Cl. D7—79



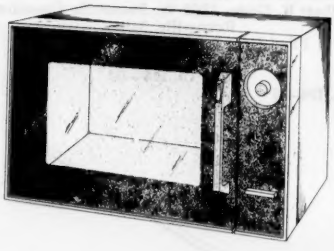
235,124
BREAD TOASTER
John E. Jolliffe, Manlius, N.Y., assignor to SCM Corporation, New York, N.Y.
Filed Sept. 24, 1973, Ser. No. 400,309
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—93



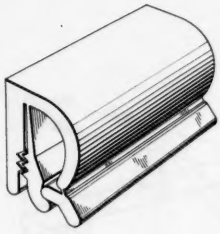
235,125
POT COVER HOLDER HOOK OR THE LIKE
Ruth C. Schlachter, Wheaton, Ill. (406 Lincoln, Downers Grove, Ill. 60515)
Filed Mar. 5, 1973, Ser. No. 337,905
Term of patent 3½ years
Int. Cl. D7—*99;* D8—*08*
U.S. Cl. D7—129



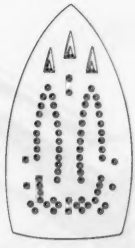
235,126
PORTABLE MICROWAVE OVEN OR SIMILAR ARTICLE
Thomas J. Binzer and Charles H. Schmitt, Louisville, Ky., assignors to General Electric Company
Filed Dec. 20, 1972, Ser. No. 316,894
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



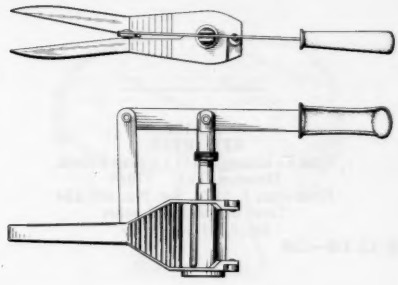
235,127
HANGER FOR LITTER BAGS AND THE LIKE
Ethan C. Grant, P.O. Box 2091, Salem, Oreg. 97308
Filed July 23, 1973, Ser. No. 381,526
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D7—193



235,128
ELECTRIC IRON SOLEPLATE
John L. Eaton, Jr., Delanco, N.J., and Roger V. Eeckhout, Warminster, Pa., assignors to SCM Corporation, New York, N.Y.
Filed Sept. 17, 1973, Ser. No. 398,113
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—204

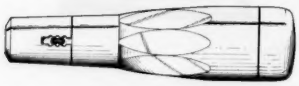


235,129
BOTTLE-CORKING APPARATUS
Gilbert Tabard, Villemomble, France, assignor to Societe d'Exploitation des Ateliers Mecaniques A. Tabard, Villemomble, France
Filed July 13, 1973, Ser. No. 378,912
Claims priority, application France Jan. 15, 1973
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51

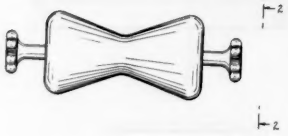


235,130
HAND HELD PICK-UP IMPLEMENT
Dorsey L. Helm, 9732 Dayton Ave. N., Seattle, Wash. 98103
Filed Apr. 4, 1974, Ser. No. 457,992
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51

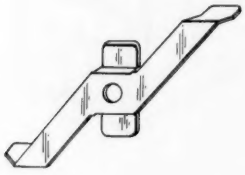
235,131
HANDLE FOR A SCREWDRIVER
Laird Fortune Covey, Easton, Conn. (% The Stanley Works, 195 Lake St., New Britain, Conn. 06050)
Filed Aug. 6, 1973, Ser. No. 386,004
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—83



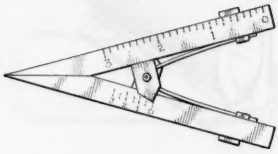
235,132
KITE REEL
Chia C. Huang, 10123 Kemp Forest, Houston, Tex. 77055
Filed Apr. 5, 1974, Ser. No. 458,224
Term of patent 14 years
Int. Cl. D8—*05, 99*
U.S. Cl. D8—220



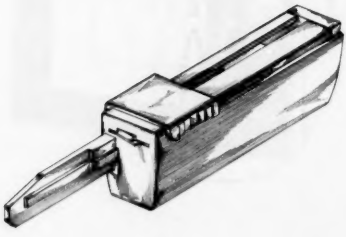
235,133
LIGHT TRACK SUPPORTING CLIP
William M. Armstrong, El Cerrito, Calif., assignor to Lektra Lighting, Inc., San Francisco, Calif.
Filed Mar. 18, 1974, Ser. No. 452,787
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—259



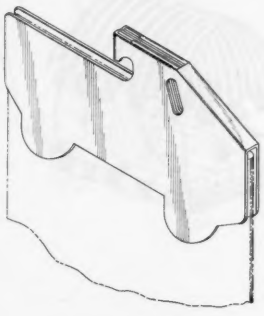
235,134
MULTI-PURPOSE CLAMP FOR HOLDING WITHIN ITS TUBULAR ELEMENTS PENCILS, WIRES OR SIMILAR ARTICLES
James J. A. Sartore, 128 Morris St., Albany, N.Y. 12208
Filed Dec. 5, 1972, Ser. No. 312,376
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—259



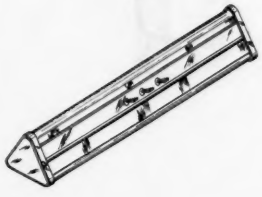
235,135
RAZOR BLADE DISPENSER
Norman D. Poisson, Andover, Mass., assignor to The Gillette Company, Boston, Mass.
Filed June 4, 1973, Ser. No. 366,559
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D9—224



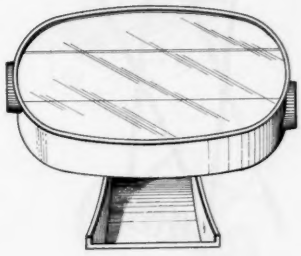
235,136
COMBINED PACKAGING CARD AND HANGER FOR AN ARTICLE OF MERCHANDISE
Charles A. Wells, Coshocton, Ohio, and Robert A. O'Neil and Michael C. Wilson, Wheaton, Ill., assignors to Pretty Products, Inc.
Filed Nov. 15, 1972, Ser. No. 306,848
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—191



235,137
DIGITAL CLOCK
James Hampson Muir, Indialantic, Fla., assignor to Monsanto Company
Filed July 12, 1973, Ser. No. 378,723
Term of patent 14 years
Int. Cl. D10—*15*
U.S. Cl. D10—15

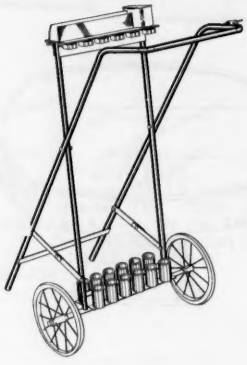


235,138
CLOCK HOUSING
Rudolf W. Blessing, Waldkirch im Breisgau, Germany, assignor to Blessing-Werke KG, Waldkirch im Breisgau, Germany
Filed Jan. 4, 1973, Ser. No. 321,041
Claims priority, application Germany Oct. 20, 1972
Term of patent 7 years
Int. Cl. D10—*01*
U.S. Cl. D10—23

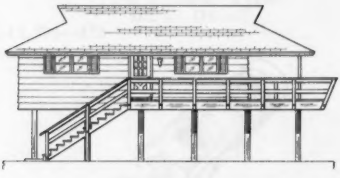


235,139
DISENGAGEABLE CONNECTOR FOR A PRESSURE TESTER
Thure Ekman, Slalomvagen 12, S–541 00, Skovde, Sweden
Filed Sept. 11, 1972, Ser. No. 287,911
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—103

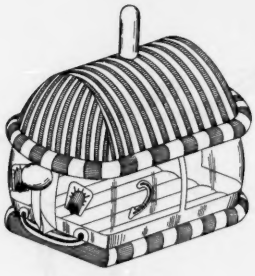
235,140
GOLF CART
Frank O. Knight, Modesto, Calif.
(627 SW. Normandy Road, Seattle, Wash. 98166)
Filed Apr. 4, 1974, Ser. No. 457,702
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—23



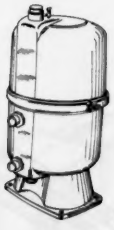
235,141
BUILDING
Ralph J. Ramer, 702 Pearl Circle, Brandon, Fla. 33505
Filed Aug. 11, 1972, Ser. No. 274,379
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 A



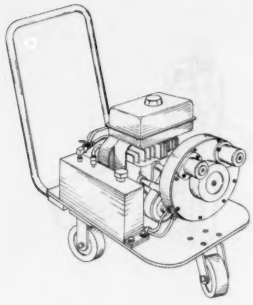
235,142
INFLATABLE AMUSEMENT STRUCTURE
Sebastian F. Nucci, 289 Fall St.,
Seneca Falls, N.Y. 13148
Filed July 16, 1973, Ser. No. 379,550
Term of patent 14 years
Int. Cl. D25—*03*; D21—*03*
U.S. Cl. D13—1 E



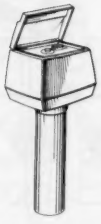
235,143
FILTER
Gordon F. Ehret, Alhambra, Calif., assignor to Swimquip Division, Weil-McLain Company, Inc., El Monte, Calif.
Filed June 11, 1973, Ser. No. 368,819
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



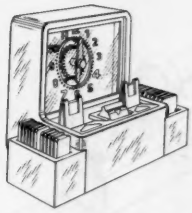
235,144
LIQUID CHEMICAL SPRAYER
James G. Parke and C. Richard Gerlach, San Antonio, Tex., assignors to Micro-Gen Equipment Corporation, San Antonio, Tex.
Filed Apr. 27, 1973, Ser. No. 354,957
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18



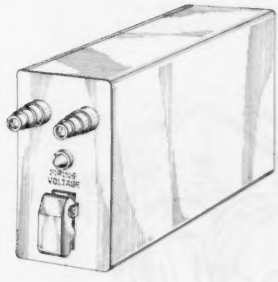
235,145
WATER SPRINKLER CONTROL HOUSING
Mario F. Fernandez, Minneapolis, Minn., assignor to The Toro Company, Minneapolis, Minn.
Filed Sept. 29, 1972, Ser. No. 293,423
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—38



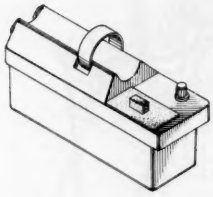
235,146
EDUCATIONAL CLOCK TOY
Michael Langieri, Butler, N.J., assignor to Questor Corporation, Toledo, Ohio
Filed Oct. 2, 1972, Ser. No. 294,446
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—64



235,147
BLASTING CONTROL
Richard N. Snyder, Springfield, Va., assignor to Safety Devices, Inc., Springfield, Va.
Filed Mar. 20, 1973, Ser. No. 342,950
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R

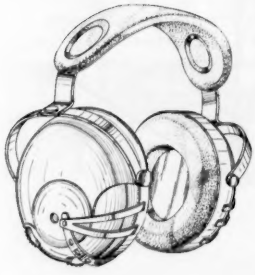


235,148
COMBINATION BATTERY HOLDER AND BATTERY
Francis W. Rowbottam, Santa Barbara, Calif., assignor to Elpower Corporation, Santa Ana, Calif.
Filed Mar. 21, 1974, Ser. No. 444,261
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—6

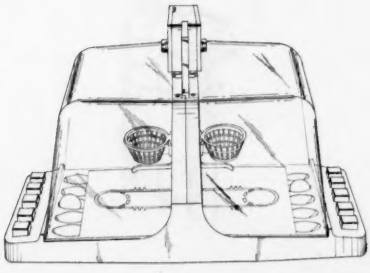


235,150
INTRAVENOUS FLUID CYLINDER
David S. Terman, 3741 S. Narcissus St., Denver, Colo. 80237
Filed Oct. 29, 1973, Ser. No. 410,602
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D32—1

235,149
COMBINATION HEADSET AND RADIO RECEIVER
Charles Dascal, Miami, Fla., assignor to Dyn Electronics Inc., Miami, Fla.
Continuation-in-part of abandoned design application Ser. No. 329,016, Feb. 2, 1973. This application May 13, 1974, Ser. No. 469,245
Claims priority, application United Kingdom Jan. 17, 1974
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 H



235,151
BASKETBALL GAME BOARD
Kazuyuki Hashimoto, Tokyo, Japan, assignor to Toytown Corporation, Tokyo, Japan
Filed Sept. 25, 1973, Ser. No. 400,660
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

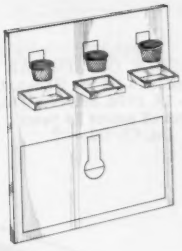


235,152
GOLF PUTTER HEAD
Truett P. Mills, Tuscaloosa, Ala., assignor to Questor Corporation, Toledo, Ohio
Filed Sept. 17, 1973, Ser. No. 397,775
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

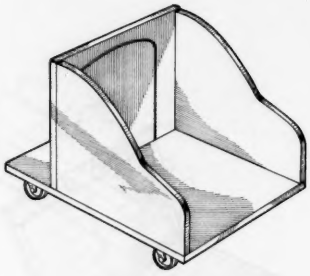
235,153
TENNIS BALL THROWER
Hector O. Conde, 6637 Cutting Blvd., El Cerrito, Calif. 94530
Filed Aug. 31, 1973, Ser. No. 393,323
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 N

235,154
GAMEBOARD
Eraldo Sansoni, Via Amendola 40, Conegliano Veneto, Treviso, Italy
Filed Nov. 2, 1973, Ser. No. 412,465
Claims priority, application Italy May 11, 1973
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

235,155
GAME TARGET
Peter J. Perkins, 1629 S. Pointview St., Los Angeles, Calif. 90035
Filed Dec. 21, 1972, Ser. No. 303,530
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 PP



235,156
TOY PLAY VEHICLE
Bonnie H. Baylor, 7701 Willowbrook Road, Fairfax Station, Va. 22039
Filed Nov. 5, 1973, Ser. No. 412,815
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

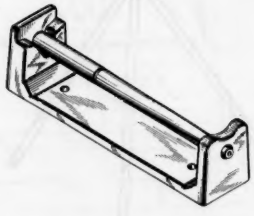


235,157
TOY BLOCK
Eugene J. Echterling, Woodland Hills, Calif., assignor to Questor Corporation, Toledo, Ohio
Filed Jan. 24, 1973, Ser. No. 326,368
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 FF

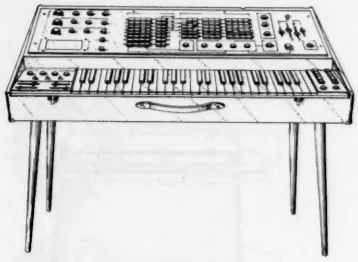
235,158
KNITTING NEEDLE OR SIMILAR ARTICLE
Ottis Daniel Pearson, 516 1st St., Rodeo, Calif. 94532
Filed Jan. 18, 1974, Ser. No. 434,505
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D47—5

235,159
CANDLE HOLDER
Robert F. Ball, Willow Grove, Pa., assignor to Country Store Products, Inc., Warrington, Pa.
Filed May 7, 1973, Ser. No. 357,692
Term of patent 14 years
Int. Cl. D26—*01*; D7—*01*
U.S. Cl. D48—2

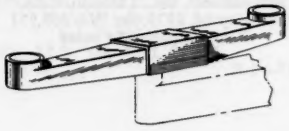
235,160
MANDRIL AND MANDRIL HOLDER
Ed Levin, % Ed Levin Arts Workshop, Bennington, Vt. 05201
Filed Aug. 31, 1973, Ser. No. 393,673
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D54—13 R



235,161
PERFORMER KEYBOARD CONSOLE
Alfred Mayer, Morristown, N.J., and George Ipolyi, Plainview, N.Y., assignors to Ionic Industries Incorporated, Morristown, N.J.
Filed Dec. 14, 1972, Ser. No. 315,178
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—2



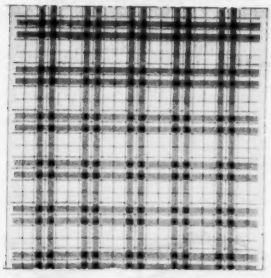
235,162
OPHTHALMIC INSTRUMENT ARM
John H. Beverage, Eggertsville, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Aug. 27, 1973, Ser. No. 391,704
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D57—1 E



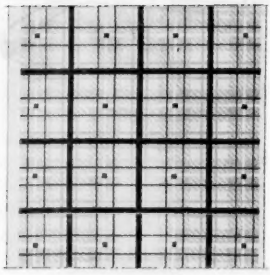
235,163
SPECTACLE FRONT
Anthony Shindler, Brookline, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Nov. 30, 1973, Ser. No. 420,752
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 F

235,164
SPECTACLE TEMPLE
Anthony Shindler, Brookline, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Dec. 26, 1973, Ser. No. 428,160
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 A

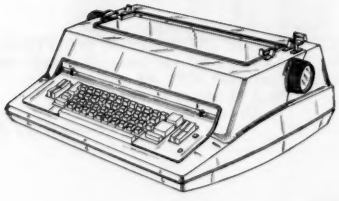
235,165
PAPER TOWELING
Mary Ellen Wassenberg, Green Bay, Wis., assignor to Fort Howard Paper Company, Green Bay, Wis.
Filed Feb. 25, 1974, Ser. No. 445,553
Term of patent 14 years
Int. Cl. D5—*03*
U.S. Cl. D59—2 A



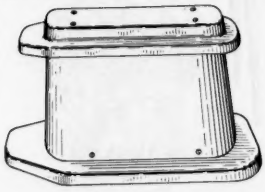
235,166
PAPER TOWELING
Mary Ellen Wassenberg, Green Bay, Wis., assignor to Fort Howard Paper Company, Green Bay, Wis.
Filed Feb. 25, 1974, Ser. No. 445,554
Term of patent 14 years
Int. Cl. D5—*03*
U.S. Cl. D59—2 A



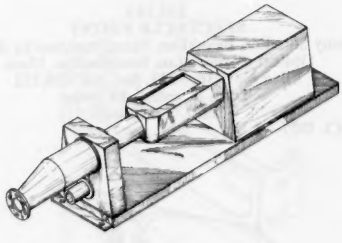
235,167
TYPEWRITER
Toshihiko Sakow, Teaneck, N.J., assignor to Litton Business Systems, Inc.
Filed Dec. 11, 1972, Ser. No. 314,249
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A



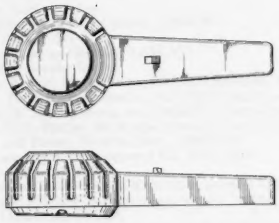
235,168
PUMP HOUSING
Gerald E. Boyer, Shawnee Mission, Kans., and Drake L. Koch, Kansas City, Mo., assignors to Boyer Industries, Inc., Kansas City, Kans.
Filed Aug. 15, 1974, Ser. No. 497,561
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D65—1 R



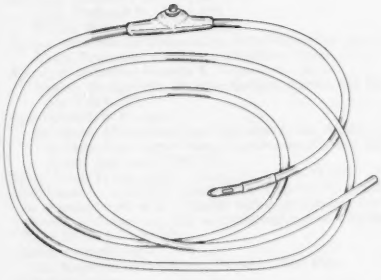
235,169
PUMP
Billy B. Lovejoy, Littleton, Colo., assignor to Industries International, Inc., Littleton, Colo.
Filed May 14, 1973, Ser. No. 359,971
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D65—1 R



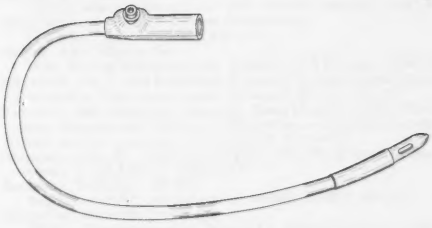
235,170
COMBINED HEATING AND MASSAGING UNIT
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.
Filed Nov. 19, 1973, Ser. No. 416,863
Term of patent 14 years
Int. Cl. D28—*03;* D24—*99*
U.S. Cl. D83—1 T



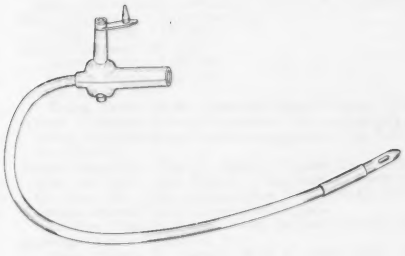
235,171
CATHETER
Jack L. Boone, Larkin Township, Midland County, Mich., assignor to Dow Corning Corporation, Midland, Mich.
Filed Mar. 12, 1973, Ser. No. 340,489
Term of patent 14 years
Int. Cl. D24—*02, 04*
U.S. Cl. D83—12 A



235,172
CATHETER
Jack L. Boone, Larkin Township, Midland County, Mich., assignor to Dow Corning Corporation, Midland, Mich.
Filed Mar. 12, 1973, Ser. No. 340,487
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—12 A



235,173
CATHETER
Jack L. Boone, Larkin Township, Midland County, Mich., assignor to Dow Corning Corporation, Midland, Mich.
Filed Mar. 12, 1973, Ser. No. 340,488
Term of patent 14 years
Int. Cl. D24—*02, 04*
U.S. Cl. D83—12 A



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF MAY, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Jones, Peter Hadley; McAlpine, James Bruce; Pauvlik, Jeanne Marie; and Perun, Thomas John, 3,884,904.

ABE Engineering & Development Co. Ltd.: *See—*
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Abe, Toshihiro; and Tokaiwa, Kiyoshi, to Jidosha Kiki Kabushiki Kaisha. Fluid pressure regulator valve and safety valve assembly. 3,884,533, Cl. 303-84.00A.

Abels, Theodor; and Puschel, Siegfried, to Linde Aktiengesellschaft. Electric-powered vehicle with time-delay switch circuitry, especially for electrical vehicles. 3,884,318, Cl. 180-65.00R.

Abels, Theodore; and Puschel, Siegfried, to Linde Aktiengesellschaft. Drive arrangement using electric motor with variable hydraulic transmission set in predetermined relationship to minimize battery drain. 3,885,204, Cl. 318-139.000.

Abendroth, Paul, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Device for fastening flexible printing plates. 3,884,147, Cl. 101-415.100.

ACF Chemiefarma N.V.: *See—*
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Ackley, Edward M., to R. W. Hartnett Company. Conveyor link for tablet printing apparatus. 3,884,143, Cl. 101-37.000.

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Adamovske strojirny, narodni podnik: *See—*
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Agius, Frank P. Key cutter. 3,884,121, Cl. 90-13.050.

Ahle, James L., to Gulf Research & Development Company. Synergistic chemical control of nutsedge with combination of a 1-methyl-4-phenyl-pyridinium salt and a cyclopropylamino-triazine herbicide. 3,884,672, Cl. 71-93.000.

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Ooya, Junichiro; Sakakibara, Naoji; Kawabata, Yasuhiro; Nawa, Hideo; Hida, Takashi; Tarao, Akira; Tsukuba, Korehiko; and Kuwana, Kazutaka, 3,885,137.

Aizawa, Tsuneo, to Amada Company, Ltd. Adjustable saw. 3,884,106, Cl. 83-453.000.

Ajlouny, Nadim S., to Bendix Corporation, The. Programmable universal transfer device. 3,884,363, Cl. 214-1.0BB.

Aktiebolaget Ifoverken: *See—*
Johansson, Sten Gunnar, 3,884,350.

Aktiebolaget Svenska Precisionsvertyg: *See—*
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Alberto-Culver Company: *See—*
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Alexander, Carl J.; and Boudeman, Robert J., to Wells Manufacturing Corporation. Fluid valve means. 3,884,447, Cl. 251-144.000.

Alexander, Dale Bruce; and Johnstone, James Hayden, to Texas Instruments Incorporated. Method of fabricating a microminiature electronic trimmer capacitor. 3,883,937, Cl. 29-25.420.

Alexander, John D., to Boeing Company, The. Wing mounted thrust reverser. 3,884,433, Cl. 244-42.0CC.

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Alexeenko, Alexei Pavlovich: *See—*
Dudko, Daniil Andreevich; Alexeenko, Alexei Pavlovich; Lychko, Ivan Ivanovich; Iljushenko, Valentin Mikhailovich; Suschuk-Sljusarenko, Igor Ivanovich; Tarnovsky, Alexandr Grigorievich; Kostevich, Dmitry Nikolaevich; Andrusenko, Jury Iosifovich; Gurevich, Samuil Markovich; and Strakhov, Gennady Nikolaevich, 3,885,121.

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Davis, Royal E.; Roy, Amedee; Belleau, Claude; and Allardyee, Gordon E., 3,883,944.

Allen, Brian S. Protective covering for a vehicle. 3,884,523, Cl. 296-136.000.

Allen, Joseph H.; Klemm, Waldemar A.; and Luker, John P., to General Portland, Inc. Expansive cement. 3,884,710, Cl. 106-89.000.

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Alley, Starling K., Jr.; and Attane, Edward C., Jr., to Union Oil Company of California. Hydrofining-reforming process. 3,884,797, Cl. 208-89.000.

Allied Chemical Corporation: *See—*
Massengill, Roy H.; and Buff, Ernest D., 3,884,497.

Allison, David F., to Signetics Corporation. Semiconductor structure and method. 3,883,948, Cl. 29-577.000.

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Alten, Kurt. Bridge for ramps. 3,883,917, Cl. 14-71.000.

Altermatt, Ruedi, to Sandoz Ltd. Substituted 4-(2-nitro-4-phenoxysulfonylanilino)phenylazopyrazoles. 3,884,900, Cl. 260-162.000.

Alvic Development Corporation: *See—*
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Amada Company, Ltd.: *See—*
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Amann, August: *See—*
Koenig, Horst; Thieme, Peter; and Amann, August, 3,884,930.

Amano, Yoshifumi, to Sony Corporation. Flat panel display apparatus having electrodes aligned with isolating barrier ribs. 3,885,195, Cl. 315-169.0TV.

Amass, Allan John; Butcher, Anthony Vincent; Duck, Edward William; and Locke, John Michael, to International Synthetic Rubber Co., Ltd., The. Olefin polymerization. 3,884,894, Cl. 260-93.700.

American Aniline Products, Incorporated: *See—*
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American Carrier Equipment: *See—*
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American Challenger Corporation: *See—*
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American Cyanamid Company: *See—*
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American Standard Incorporated: *See—*
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American Telephone and Telegraph: *See—*
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Ames, Victor H.; and Hartelius, Marshall V., to Whiting Corporation. Automatically traction effort controlled convertible rail-highway tractor. 3,884,156, Cl. 105-75.000.

AMF Incorporated: *See—*
Du Bosque, Clayton, Jr.; and Lowenson, Jeffrey, 3,885,207.
Neville, Richard E. G., 3,883,959.

Amos, Homer C., to Brunswick Corporation. Machine and method for producing a three dimensional lattice. 3,884,445, Cl. 249-205.000.

Amouriq, Bernard Albert. Animated surface display device. 3,883,969, Cl. 40-106.520.

AMP Incorporated: *See—*
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Anbar, Michael, to Stanford Research Institute. Mass spectrometric determination of carbon 14. 3,885,155, Cl. 250-283.000.

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Anderson, John W.; Barney, John J.; Flanagan, James J.; and Krupa, Vernon, to Leesona Corporation. Extrusion die. 3,884,611, Cl. 425-376.000.

Anderson, Robert Craig; and Calder, Alan, to Imperial Chemical Industries Limited. Smoking mixtures. 3,884,245, Cl. 131-2.000.

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Andersson, Karl Erik Gustav, to AB Motala Verkstad. Apparatus for feeding material to a gas generator. 3,884,397, Cl. 222-370.000.

Andrea, Christo, to Combustion Engineering, Inc. Nuclear fuel preheating system. 3,884,624, Cl. 432-227.000.

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Anthony, Parme G., to General Motors Corporation. Rotary engine rotor seal lubrication. 3,884,601, Cl. 418-90.000.

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Ashkenazi, Ellis, to GET Automatic Electric Laboratories Incorporated. Vault door. 3,884,515, Cl. 292-34.000.

Ashton, Christopher John, to Marler Haley ExpoSystems Limited. Frames. 3,883,974, Cl. 40-152.000.

Aspinall, Richard L.; and Cammarata, Peter S., to G. D. Searle & Co. Antiinflammatory use of prostaglandins. 3,885,041, Cl. 424-318.000.

Asselineau, Lionel: *See—*
Mikitenko, Paul; Cohen, Georges; and Asselineau, Lionel, 3,884,769.

Assembergs, Carl J., to Koppen & Lethem Trading Co. A.G. Pressure control device for a hydraulic circuit. 3,884,262, Cl. 137-489.000.

Astrosystems, Inc.: *See—*
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Athy, Lawrence F., Jr., to Southwestern Manufacturing Co. Rate of pressure change sensing system. 3,884,077, Cl. 73-388.00R.

Atlantic Products Corporation: *See—*
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Atlantic Research Corporation: *See—*
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Attane, Edward C., Jr.: *See—*
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Atteny, Inc.: *See*—
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Auguste Leveau, Raymond Louis. Self-driven machine, with differential steering. 3,884,320, Cl. 180-79.20C.

Aumayer, Hansruedi: *See*—
Guaglione, Giovanni Paolo; and Aumayer, Hansruedi, 3,885,114.

Austin, Lowell W., to National Steel Corporation. Direct current electrolytic etching of aluminum foil without the use of contact rolls. 3,884,783, Cl. 204-129.350.

Automotive Environmental Systems, Inc.: *See*—
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Avery Products Corporation: *See*—
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Avramidis, Stellios Antony, to FMC Corporation. Multi-speed motion transmitting mechanism. 3,884,089, Cl. 74-217.00C.

Avramidis, Stellios Antony; and Craig, John L., to FMC Corporation. Two stage transmission. 3,884,097, Cl. 74-740.000.

Baba, Hajime: *See*—
Nagase, Shunji; Baba, Hajime; Kodaira, Kazuo; and Okazaki, Kooshi, 3,884,775.

Baba, Yuji, to Nippon Steel Glass Co. Ltd.; and Uni Design Co. Ltd. Mirror for interior decorative use. 3,884,559, Cl. 350-288.000.

Backhaus, Karl L.: *See*—
Tuschak, George; and Backhaus, Karl L., 3,884,400.

Bacon, James L.; and Simpson, Henry W., to International Business Machines Corporation. Cleaning apparatus. 3,884,572, Cl. 355-15.000.

Badger, John P.; and Bernholtz, Herbert A., to Eltra Corporation. Method of activating storage batteries. 3,884,724, Cl. 136-114.000.

Badin, Elmer J.; Kerschner, Paul M.; and Cresti, Aldo, to Cities Service Oil Service Company. Hydrocarbon fuel compositions. 3,884,947, Cl. 260-404.500.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See*—
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Baer, Stephen C., to Zomeworks Corporation. Solar heating device. 3,884,414, Cl. 236-49.000.

Bagdasarian, Alex; and Donovan, James, to Artisan Industries Inc. Apparatus and process for continuous concentration of solids from a solids-containing fluid. 3,884,805, Cl. 210-65.000.

Bagdasarian, Alex: *See*—
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Bagnasco, Dante V., to Safety Snap Pin Corporation. Safety pin. 3,883,930, Cl. 24-156.00R.

Bahder, George; Eager, George S., Jr.; and Silver, David A., to General Cable Corporation. High voltage solid extruded insulated power cables. 3,885,085, Cl. 174-36.000.

Bailey, Paul T.: *See*—
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Baird, Robert Gordon: *See*—
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Baitinger, Utz G.; and Najmann, Knut K., to International Business Machines Corporation. Monolithic storage array and method of making. 3,884,732, Cl. 148-175.000.

Bakassian, Georges; and Lefort, Marcel, to Rhone-Poulenc, S.A. Process for the preparation of nitriles from acids and organosilyamines. 3,884,957, Cl. 260-465.00B.

Baker, Basil Offor; and Ross, John William Ellis, to M-O Valve Company Limited, The. Excess voltage arresters. 3,885,202, Cl. 317-61.000.

Baker, Basil Offor; and Ross, John William Ellis, to M-O Valve Company Limited, The. Excess voltage arresters. 3,885,203, Cl. 317-61.000.

Baker, Don R.; and Gutman, Arnold D., to Stauffer Chemical Company. Certain oxime compositions and their use in controlling fungi. 3,885,043, Cl. 424-327.000.

Balevski, Angel Tontchev; and Nikolov, Ivan Dimov, to Institut po Metaloznanie i Technologia na Metalite. Apparatus for production of castings from alloys of metals and gases. 3,884,291, Cl. 164-312.000.

Ball, Anthony Donald: *See*—
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Ball, Martin Frank, to Metal Box Company Limited, The. Container closures. 3,884,382, Cl. 220-272.000.

Ball, Rowland E.; and Wiese, Winfred J., to Borg-Warner Corporation. Cooled seal cartridge. 3,884,482, Cl. 277-17.000.

Ballard, Edward Cooper; and Priest, John Ricks, to du Pont de Nemours, E. I., and Company. Low gel content ethylene copolymer/wax blends and process for preparation thereof. 3,884,857, Cl. 260-28.5AV.

Ballard, Robert L. Panel destacker. 3,884,368, Cl. 214-8.50D.

Ballestra, Mario; and Triberti, Domenico. Device for performing highly exothermic reactions. 3,884,643, Cl. 23-285.000.

Baranowski, Hans-Peter: *See*—
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Barber, Everett M.; Brandenburg, John T.; and Frost, Richard A., to Texaco Inc. Internal combustion engine system for exhaust emissions control utilizing an acoustic catalytic muffler. 3,884,037, Cl. 60-292.000.

Barber, F. Taylor, to Phillips Petroleum Company. Manufacture of trialkyltrithiophosphites and trialkylphosphorothioates. 3,885,002, Cl. 260-972.000.

Barbito, Robert, Sr. Spike and cleat guard. 3,883,963, Cl. 36-2.5AN.

Bardo, Gerald Blaine; and Zalepa, Leonard John, to International Business Machines Corporation. Apparatus and method for opening and emptying envelopes of various thicknesses. 3,884,010, Cl. 53-3.000.

Barkan, Philip; and Oppel, John A., to General Electric Company. Control for an electric circuit breaker with valve and piston operating means. 3,885,113, Cl. 200-82.00B.

Barkman, Erik F.; Jackson, John Harry; and Ward, Bennie Ray, Jr., to Reynolds Metals Company. Metal composite and method of producing the same. 3,884,731, Cl. 148-127.000.

Barnes, Guy W. Sign with changeable character plates. 3,883,967, Cl. 40-65.000.

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Battelle Development Corporation: *See*—
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Battelle Memorial Institute: *See*—
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Bauer, Sigrid; and Sikora, Helga, to Hoechst Aktiengesellschaft. Light-sensitive transfer material. 3,884,693, Cl. 96-15.000.

Baum, Helmut: *See*—
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Baumann, Horst: *See*—
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Baumann, Reinhold; Lauerbach-Lemeier, Robert; Kunze, Ernst-Gunter; Striebich, Alfred; and Rothe, Hans-Joachim, to Davy-Ashmore Aktiengesellschaft. Process for the production of regenerate from polypropylene waste. 3,884,855, Cl. 260-2.300.

Baumberger, Bastian O.: *See*—
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Baxter, Samuel; and Gilbert, John Harold, to Monsanto Chemicals Limited. Fibrillated foamed textile products and method of making same. 3,884,030, Cl. 57-140.00R.

Bayer Aktiengesellschaft: *See*—
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Schrader, Gerhard; and Hammann, Ingeborg, 3,884,999.
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Bazell, Seymour; Ostensen, Ralph G.; Goldberg, Edward M.; and Walker, Robert D., to MPC/Kurgisil. Catheter assembly. 3,884,242, Cl. 128-351.000.

BBC Brown Boveri & Company Limited: *See*—
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Bean, Kenneth Elwood, to Texas Instruments Incorporated. Dielectric isolation process. 3,884,733, Cl. 148-175.000.

Bean, Lloyd F., to Xerox Corporation. Color correction method. 3,884,686, Cl. 96-1.400.

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Beck, Gunther; and Holtschmidt, Hans, to Bayer Aktiengesellschaft. Chlorothianthrenes. 3,885,044, Cl. 260-327.00P.

Beckman, Paul; Gerding, Benjamin F.; and Jain, Prabhat Kumar, to Robinson-Halpern Company. Accelerometer assembly. 3,884,085, Cl. 73-517.00R.

Beers, Ronald W.; and Lakritz, Julian, to Exxon Research & Engineering Company. Zinc enriched lithium silicate-latex coating composition. 3,884,863, Cl. 260-29.60S.

Beesley, Merrill P. Cleaning structure for revolvable pads of floor maintenance equipment. 3,884,250, Cl. 134-88.000.

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Bellis, George D. Oar reversing device. 3,884,175, Cl. 115-24.300.

Beloit Corporation: *See—*
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Beltrao, Helio Marcos Penna: *See—*
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Berger, Hans-Jurgen: *See—*
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Bergeron, Louis, to Centre National d'Etudes Spatiales. Methods of improving printing resolution in chain type printers. 3,884,148, Cl. 101-426.000.

Bergin, William P.; and Farmer, Charles C., to Honeywell, Inc. Binary-to-percent converter. 3,885,134, Cl. 235-92.0DM.

Berglund, Carl Neil, to Bell Telephone Laboratories, Incorporated. Apparatus and method for connecting between series and parallel data streams. 3,885,167, Cl. 307-221.00C.

Bergmeister, Eduard: *See—*
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Bergstreser, Neil E.: *See—*
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Bergstrom, Sten R.; Dahlgren, Ake; and Roos, Kjell, to Konsult AB Gerontologia. Resettable timer-alarm device used in monitoring geriatric patients. 3,885,235, Cl. 340-279.000.

Beriger, Ernst; and Martin, Henry, to Ciba-Geigy AG. S. S.-dialkyl-o-and s-alkenyl phosphites and phosphates. 3,885,000, Cl. 260-956.000.

Berk, Jerome: *See—*
Shaw, Irving F.; and Berk, Jerome, 3,885,027.

Bernady, Karel Francis; Poletto, John Frank; and Weiss, Martin Joseph, to American Cyanamid Company. 1-Alkoximino-2-(ω-substituted-alkyl)-2-cyclopentenes. 3,884,953, Cl. 260-456.00A.

Bernauer, Karl; Borgulya, Janos; Montavon, Marc; Breitschneider, Hermann; Hohenlohe-Oehringen, Kraft; and Weis, Gunter, to Hoffmann-LaRoche Inc. 7-Amino norbornane derivatives. 3,884,976, Cl. 260-563.00P.

Bernewasser, Horst; and Scholl, Hans, to Kochs Adler AG. Device for feeding, removing and stacking workpieces. 3,884,167, Cl. 112-121.290.

Bernholtz, Herbert A.: *See—*
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Bernier, Robert V., to TRW Inc. Stereo viewer for a pair of arcuate stereo image strips. 3,884,551, Cl. 350-142.000.

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Berquist, Frank H., to Harper-Wyman Company. Oven control. 3,884,413, Cl. 236-15.00A.

Berry, Milton E., to Southwire Company. Method and apparatus for tundish level control. 3,884,288, Cl. 164-4.000.

Bertea Corporation: *See—*
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Berthelot, Guy; Guillot, Philippe; and Perez, Jean-Jacques, to Commissarariat a L'Energie Atomique. Device for automatic thermochemical analysis. 3,885,208, Cl. 318-625.000.

Bertozzi, Marcello; and Chioffi, Mario, to P. R. Mallory & Co. Inc. Timer having two separate cam means and means advancing the cam means at different speeds. 3,884,088, Cl. 74-84.000.

Beuter, Richard, to Brown, Boveri and Cie A.G. Transistorized ignition system for internal combustion engines. 3,884,208, Cl. 123-148.00E.

BHS-Bayerische Berg Hutten-und Salzwerke Aktiengesellschaft: *See—*
Gumpoltsberger, August, 3,884,098.

Bianchi, Vittorio Luigi Achille. Press provided with a press-plate with three degrees of freedom. 3,884,107, Cl. 83-534.000.

Bianchino, Pietro; Vitale, Eupremio; Guerra, Guido; and Censoni, Giustino. 1,1-Diphenyl-1'-phenylthio-di-propylamine and the salts thereof. 3,884,939, Cl. 260-343.700.

Bianco, John. Aid for driving golf balls. 3,884,477, Cl. 273-183.00D.

Bice, Archie Robert; Fitzgerald, James Allen; and Hoover, Alan Ellsworth, to du Pont de Nemours, E. I., and Company. Preparation of poly(p-phenylene terephthalamide) by mixing solution of p-phenylene diamine with molten terephthaloyl chloride. 3,884,881, Cl. 260-78.00R.

Bir, Wallace G.; and Novack, Joseph, to Monsanto Company. Recovery of alkenyl-aromatic monomers by falling strand devolatilization. 3,884,766, Cl. 202-173.000.

Birchall, George Richard; Hepworth, Walter; and Smith, Steven Collyer, to Imperial Chemical Industries Limited. 1-(Quinazolinyl) indol-3-ylacetic acids, esters and amides. 3,884,919, Cl. 260-256.40Q.

Bjorksten Research Laboratories, Inc.: *See—*
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Black and Decker Manufacturing Company, The: *See—*
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Blackman, Seymour N. Method of making a clinical monocoque glass thermometer. 3,884,666, Cl. 65-110.000.

Blackwell Electronics Ind. Co., Limited: *See—*
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Blad, Leiv H.; and Warkow, Robert F., to Lockheed Aircraft Corporation. Fiber-reinforced epoxy composite joints. 3,885,071, Cl. 428-60.000.

Blair, Noel D., to Hooker Chemicals & Plastics Corporation. Anti-corrosion weldable coating compositions. 3,884,705, Cl. 106-1.000.

Blair, Ronald L. Flotation life jacket. 3,883,914, Cl. 9-341.000.

Blake, Gerald L. Belt buckle. 3,883,928, Cl. 24-163.00R.

Blanchard, Willard S., Jr.; and Johnson, Joseph L., Jr., to United States of America, General Counsel. High-lift aircraft. 3,884,432, Cl. 244-15.000.

Blessings Products, Incorporated: *See—*
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Blessington, Bruce A.: *See—*
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Bloch, Jack, to Foster Grant Co., Inc. Sunglass display stand. 3,884,357, Cl. 211-13.000.

Blomback, Gustaf Erik Birger; Blomback, Margareta; Claeson, Karl Goran; and Svendsen, Lars-Gundro, to AB Bofors. New substrates for diagnostic use, with high susceptibility to thrombin and other proteolytic. 3,884,896, Cl. 260-112.500.

Blomback, Margareta: *See—*
Blomback, Gustaf Erik Birger; Blomback, Margareta; Claeson, Karl Goran; and Svendsen, Lars-Gundro, 3,884,896.

Blomberg, Harvey: *See—*
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Blomberg, Richard N., to du Pont de Nemours, E. I., and Company. Composition, process and article. 3,884,989, Cl. 260-857.00R.

Bloom, Stanley H. Catalyst system and method for improving the leaching of elements such as copper from their ores using the catalyst system. 3,884,831, Cl. 252-429.00R.

Blount, R. E.: *See—*
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Bodnick, Sheldon; and Stark, Thomas M., to Exxon Research & Engineering Company. Mixed refrigerant cycle. 3,884,044, Cl. 62-9.000.

Bodnick, Sheldon: *See—*
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Bodor, Nicolae S., to INTERX Research Corporation. Pro-drug forms of digoxin. 3,884,905, Cl. 260-210.500.

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Boeing Company, The: *See—*
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Bohn, August C. Holder for fishline release button. 3,883,981, Cl. 43-43.120.

Bollinger, Luther L., Sr., to Hennessy Products, Incorporated. Car door operating structure. 3,883,992, Cl. 49-362.000.

Bolt, Kenneth Dale: *See—*
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Bombola, Frank, to E/M Lubricants, Inc. Process for treating molds used in molding glass parts. 3,885,062, Cl. 427-133.000.

Bon, Charles K.; and Moolenaar, Robert J., to Dow Chemical Company, The. Neutron attenuating construction material. 3,884,839, Cl. 252-478.000.

Bond, Robert W.; and Alexander, William J., III, to Bond Transmission & Controls, Inc. Loom cloth roll take up. 3,884,271, Cl. 139-1.00R.

Bond Transmission & Controls, Inc.: *See*—
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Bonnema, Jentje; and Simon, Henri J. H., to Stamicarbon B.V.,. Process for recovering ammonium sulphate from aqueous solutions of ammonium sulphate containing organic constituents and heavy metal ions. 3,884,644, Cl. 23-299.000.

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Booth, Raymond E.: *See*—
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Boots Pure Drug Company: *See*—
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Borcuk, Louis J., to Borcuk, Louis J.; and Borcuk, Joseph J. Force transmitting coupling. 3,884,050, Cl. 64-19.000.

Borden, Inc.: *See*—
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Borg-Warner Corporation: *See*—
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Bosquain, Maurice; Bourjot, Marcel; and Kirsch, Maurice, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes George Claude. Method and apparatus for winding vertical cores. 3,884,424, Cl. 242-7.020.

Bostrom, Sigward, to Arenco-JM AB. Apparatus for wrapping goods with stretched foil. 3,884,016, Cl. 53-182.000.

Botterill, Elbert Edward, to Metal Box Company Limited, The. Article transfer apparatus. 3,884,361, Cl. 214-1.0BT.

Bottoms, Clifford C. Bearing structure for telescoping well tool. 3,884,051, Cl. 64-23.700.

Boudeman, Robert J.: *See*—
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Bourjot, Marcel: *See*—
Bosquain, Maurice; Bourjot, Marcel; and Kirsch, Maurice, 3,884,424.

Bouy, Pierre; and Malzac, Guillaume, to Rhone-Progil. Processes for the electrolysis of alkali halides employing dismantleable bipolar electrodes. 3,884,781, Cl. 204-98.000.

Bowden, Murrae John Stanley; and Chandross, Edwin Arthur, to Bell Telephone Laboratories, Incorporated. Positive photoresist comprising polysulfones formed by reacting vinyl aromatic hydrocarbons with sulfur dioxide. 3,884,696, Cl. 96-35.000.

Bowen, Willard L., to Torrington Company, The. Fractured bearing race. 3,884,406, Cl. 225-103.000.

Bowers, Michael R., to Yamaha International Corporation. Motorcycle transmission. 3,884,316, Cl. 180-33.00B.

Bowman, David G.: *See*—
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Bradshaw, Robert S.; Greene, Alfred A.; Hunter, James R.; Lazzarotti, S. James; Mann, Abe; and Rosenblatt, Herbert L., to Burroughs Corporation. System for sorting and processing articles including flat mail pieces. 3,884,370, Cl. 214-11.00R.

Bram, Georges Eugene, to Pont-a-Mousson S.A. Device for the tensile locking of pipe elements. 3,884,510, Cl. 285-39.000.

Brammer, Robert C. Ground anchor for mobile homes and the like. 3,884,450, Cl. 254-164.000.

Bramwell, Alan; Burrell, John William Kidman; Ward, Peter; and Hagemann, Alfred, to Lever Brothers Company. Pyrazine derivative perfume compositions. 3,884,842, Cl. 252-522.000.

Brandenburg, John T.: *See*—
Barber, Everett M.; Brandenburg, John T.; and Frost, Richard A., 3,884,037.

Brandli, Gerold; and Keller, Pierre, to BBC Brown Boveri & Company Limited. Apparatus for measuring surface temperatures of thin elongated objects by infrared radiation therefrom. 3,884,075, Cl. 73-355.0EM.

Brannan, Mary Ann F.: *See*—
Roberts, Earl J.; Brannan, Mary Ann F.; and Rowland, Stanley P., 3,884,972.

Bransford, Ernest O., Jr., to Beaman Corporation. Method of forming a decorative panel and wall. 3,884,737, Cl. 156-63.000.

Braun, Ruth. Instrument for administering to the human eye. 3,884,232, Cl. 128-260.000.

Brazda, Zdenek: *See*—
Soucek, Josef; Brazda, Zdenek; and Grecenko, Alexandr, 3,884,310.

Breck, Donald W., to Union Carbide Corporation. Electrostatic printing process. 3,884,687, Cl. 96-1.400.

Breeden, John E.; and Lane, Robert E., to Hopeman Brothers, Inc. Two post insulator support for utility poles. 3,884,442, Cl. 248-221.000.

Breitschneider, Hermann: *See*—
Bernauer, Karl; Borgulya, Janos; Montavon, Marc; Breitschneider, Hermann; Hohenlohe-Oehringen, Kraft; and Weis, Gunter, 3,884,976.

Brennan, John A., to United States of America, Navy. Hydrostatic delay action fuse. 3,884,150, Cl. 102-16.000.

Brenner, Lawrence A.; and Bryant, Elmer, to Beloit Corporation. Upender for variable sizes of pressure-sensitive paper rolls. 3,884,362, Cl. 214-1.00Q.

Brenner, Wolfgang; Feier, Gunter; and Vinnemann, Antonius, to Sulzer Brothers Ltd. Double-lift open-shed jacquard machine. 3,884,272, Cl. 139-59.000.

Bresson, Clarence R.; and Spaulding, Forrest D., to Phillips Petroleum Company. Emulsified asphalt emulsion fortified with asbestos fibers. 3,885,068, Cl. 427-394.000.

Bresson, Eugene: *See*—
Genoud, Paul; and Bresson, Eugene, 3,884,279.

Breton, Lucien. Kernel fruit shelling machine. 3,884,137, Cl. 99-625.000.

Breveteam S.A.: *See*—
Chandler, Edmond A., 3,885,074.

Brewer, Gerald K.: *See*—
Lang, William J.; Brewer, Gerald K.; Fritz, Richard B.; and Eggers, Frederick W., 3,885,226.

Brewer, Robert A. Article carrying strap. 3,884,403, Cl. 224-5.00V.

Bridge, Christopher James: *See*—
Langley, Robert; Robertson, George Heddle; and Bridge, Christopher James, 3,884,713.

Bridgeford, D. J.: *See*—
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Bridgestone Tire Co., Ltd.: *See*—
Honda, Toshio; Ueki, Takehiro; and Fukuura, Yukio, 3,884,859.

Brink, Delbert L.: *See*—
Arima, Juichi; and Brink, Delbert L., 3,884,522.

Brink, Edwin H.; and Houston, Robert K. Capsule assembly machine. 3,884,177, Cl. 118-2.000.

British and Foreign Tobacco Company, Ltd.: *See*—
Solomon, Arieh, 3,884,013.

British Hovercraft Corporation Limited: *See*—
Riddle, Lavis Albert Henry, 3,884,176.

British Steel Corporation: *See*—
Jackson, Albert Edward; and Williams, Ernest Wynne, 3,884,729.
Romanski, Andrezej Antoni Florian; Allen, Michael John; Fletcher, John Malcolm; Laing, Ian Burnett; and Markham, Harry, 3,884,840.

Britt, Robert Dewey, Jr.; and McCully, William Clair, to du Pont de Nemours, E. I., and Company. Method for predicting dyeability of yarn. 3,884,582, Cl. 356-173.000.

Britten, George C.; and Mancuso, Arion, to Manbritt Industries, Inc. Blow-molding plasticizing manifold. 3,884,452, Cl. 259-192.000.

Britten, George C., to Manbritt Industries, Inc. Plastic blow molding machine. 3,884,609, Cl. 425-242.00B.

Brody, Frederick; and Pohl, Stanley, to Clairol Incorporated. Oxidative hair dye compositions. 3,884,627, Cl. 8-10.200.

Brown, Boveri and Cie A.G.: *See*—
Beuter, Richard, 3,884,208.

Brown, Lawrence H., to Dow Corning Corporation. Carboxy-functional silicones. 3,884,860, Cl. 260-29.20M.

Brown, Milton H.: *See*—
Schick, Frederick A.; and Brown, Milton H., 3,884,128.

Brown & Williamson Tobacco Corp.: *See*—
Sexstone, John H., 3,884,741.

Bruderer, Hans; and Ruegg, Rudolf, to Hoffmann-LaRoche Inc. Imidazole derivatives. 3,884,928, Cl. 260-295.50R.

Brummet, Berthal D.: *See*—
Payet, George L.; and Brummet, Berthal D., 3,884,632.

Bruning, Klaus; Junger, Hans; Pungs, Wolfgang; Rheinfeld, Peter; Weissenfels, Franz; and Wienand, Michael, to Dynamit Nobel AG. Process and apparatus for the continuous manufacture of phenolic resin foam in endless sheets. 3,885,010, Cl. 264-46.200.

Brunswick Corporation: *See*—
Amos, Homer C., 3,884,445.

Bryant, Elmer: *See*—
Brenner, Lawrence A.; and Bryant, Elmer, 3,884,362.

Bryant, Robert G., to Gem Industries Inc. Mattress spring hanger handle. 3,883,905, Cl. 5-11.000.

Bryers, Richard W., to Foster Wheeler Corporation. Vapor generating system and method. 3,884,193, Cl. 122-4.00D.

Brynda, Vaclav: *See*—
Ripka, Josef; Junek, Jan; Vobornik, Vaclav; Lihtarova, Ludmila; Hortlik, Frantisek; Brynda, Vaclav; Ohlidal, Vladimir; Korbar, Zdenek; and Vecera, Milos, 3,884,029.

Bucalo, Louis, to Investors In Ventures Inc. Vibratory mucosa-removing tool. 3,884,239, Cl. 128-304.000.

Buchel, Karl-Heinz: *See*—
Rochling, Hans F. W.; Buchel, Karl-Heinz; and Korte, Friedrich W. A. G. K., 3,884,933.

Buchi, George, to Hoffmann-LaRoche Inc. Synthesis of unsaturated diketones. 3,884,979, Cl. 260-593.00R.

Buchmann, Cordelia Atkeson, legal representative: *See*—
Eberly, Paul E.; Cull, Neville L.; Buchmann, Fred J., deceased; and Buchmann, Cordelia Atkeson, legal representative, 3,884,834.

Buchmann, Fred J., deceased: *See*—
Eberly, Paul E.; Cull, Neville L.; Buchmann, Fred J., deceased; and Buchmann, Cordelia Atkeson, legal representative, 3,884,834.

Buchner, Stanislaw, to Sulco Basel AG. Diisoquinolyl-dipyridyl-butanes, their salts and their manufacturing process. 3,884,925, Cl. 260-288.00R.

Buder, Eckart; and Knabenbauer, Wolfgang, to Varta Batterie Aktiengesellschaft. Method and device for introducing active mass into porous electrode structures for galvanic cells. 3,884,717, Cl. 136-67.000.

Budker, Gersh Itskovich; Karliner, Marlen Moiseevich; Makarov, Ivan Grigorievich; Morozov, Sergei Nikolaevich; Nezhevenko, Oleg Alexandrovich; Ostreiko, Gennady Nikolaevich; and Shekhtman, Isai Abramovich. Microwave electron discharge device. 3,885,193, Cl. 315-5.250.

Buff, Ernest D.: *See—*
Massengill, Roy H.; and Buff, Ernest D., 3,884,497.

Bugaut, Andree: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,884,625.

Bull, Willard C.; Wright, Charles H.; and Pastor, Gerald R., to United States of America, Interior. Solvent refined coal process including recycle of coal minerals. 3,884,794, Cl. 208-8.000.

Bunker Ramo Corporation: *See—*
Schrotter, Wolfgang Adalbert, 3,885,115.

Burch, Charles H.; and Medendorp, Roger L., to Kirkhof Manufacturing Corporation. Nesting container. 3,884,383, Cl. 220-72.000.

Burke, George K.: *See—*
Raines, Kenneth; and Burke, George K., 3,884,229.

Burke, N. I.; and Bridgeford, D. J., to Tee-Pak, Inc. Strong acid neutralization of polymeric alcohol xanthates. 3,884,908, Cl. 260-218.000.

Burkert, Edward F., to Freeman Supply Company, The. Thermoplastic pattern material. 3,884,708, Cl. 106-38.600.

Burkholder, Ward J.; Miller, Glenn E.; and Hays, Ronald C., to Goodyear Tire & Rubber Company, The. Process for the production of photograde hydroquinone. 3,884,983, Cl. 260-621.00A.

Burkle, Peter, to Siemens Aktiengesellschaft. Monitoring arrangement for a blower. 3,885,200, Cl. 317-40.00R.

Burlingame, Richard D., to Luria Brothers & Co., Inc. Process for producing high-grade metallic products from solid slags and high-grade metallic products. 3,883,997, Cl. 51-316.000.

Burnett, Alan, to Wickman Machine Tool Sales Limited. Drive circuits for stepping motors. 3,885,210, Cl. 318-696.000.

Burns, Henry Knox, III. Shrink-film package. 3,884,935, Cl. 206-322.000.

Burrell, Charles E. Convertible aircraft having oppositely rotating rotors. 3,884,431, Cl. 244-7.00A.

Burrell, John William Kidman: *See—*
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Burron Medical Products, Inc.: *See—*
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Burroughs Corporation: *See—*
Bradshaw, Robert S.; Greene, Alfred A.; Hunter, James R.; Lazzarotti, S. James; Mann, Abe; and Rosenblatt, Herbert L., 3,884,370.

Burroughs Wellcome Co.: *See—*
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Bush, Norbert: *See—*
Mauvernay, Roland-Yves; Bush, Norbert; Moleyre, Jacques; Monteil, Andre; and Simond, Jacques, 3,884,923.

Bush, Roberta F. Pattern fitting tool and method of custom fitting patterns. 3,883,955, Cl. 33-12.000.

Bushick, Ronald D.; and Hirschler, Alfred E., to Sun Ventures, Inc. Catalytic conversion of polycyclic aromatic hydrocarbons in the presence of hydrogen. 3,884,986, Cl. 260-668.00F.

Butcher, Anthony Vincent: *See—*
Amass, Allan John; Butcher, Anthony Vincent; Duck, Edward William; and Locke, John Michael, 3,884,894.

Butcher, Peter E., to Metal Box Limited. Machine for closuring containers. 3,884,017, Cl. 53-296.000.

Buthe, Theo, to Jean Walterscheid GmbH. Protective guard device for a transmission shaft. 3,884,536, Cl. 308-37.000.

Butler, Anthony J., to Dow Corning Corporation. Propellants and refrigerants based on trifluoropropene. 3,884,828, Cl. 252-305.000.

Butler, Gene R.; and Butler, Lee D., to Sperry Rand Corporation. Machine for forming a compact stack of crop material. 3,884,021, Cl. 56-346.000.

Butler, Lee D.; Fisher, Raymond E.; and Fontrier, Albert D., to Sperry Rand Corporation. Mechanical drive for a receiving table on a bale wagon. 3,884,367, Cl. 214-6.00B.

Butler, Lee D.: *See—*
Butler, Gene R.; and Butler, Lee D., 3,884,021.

Buttner, Gerhard; Klauke, Erich; Frohberger, Paul-Ernst; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. 2-Trifluoromethylimino-benzo-heterocyclic compounds. 3,884,931, Cl. 260-307.00D.

Buzan, Wendell P., to Raymond Lee Organization, Inc., The, a part interest. Golfer's training device. 3,884,478, Cl. 273-183.00B.

Byrnes, Robert M., Sr. Protective glove for use in meat processing plants. 3,883,898, Cl. 2-167.000.

Byron Jackson Inc.: *See—*
McFadden, Edward Joseph, 3,884,519.

Cable, John A.; Cable, Stephen J.; and Falbo, Richard R., to United States Ceramic Tile Company. Method for fast firing glazed ceramic tile trim pieces. 3,884,619, Cl. 432-2.000.

Cable, Stephen J.: *See—*
Cable, John A.; Cable, Stephen J.; and Falbo, Richard R., 3,884,619.

Cadbury Limited: *See—*
Stephens, Derek James; MacFarlane, Eseni Gogo; and Turner, Owen James, 3,884,343.

Cady, James H.: *See—*
Arrandale, Roy S.; Cady, James H.; and Hartman, Leroy C., 3,884,184.

Cain, Dona G. Adjustable length garment. 3,883,896, Cl. 2-74.000.

Cairns, Elton J.: *See—*
Gay, Eddie C.; Shimotake, Hiroshi; Cairns, Elton J.; and Walsh, William J., 3,884,715.

Calder, Alan: *See—*
Anderson, Robert Craig; and Calder, Alan, 3,884,245.

Caldwell, Edward N., to Robertshaw Controls Company. Valve construction and improved parts for the same or the like. 3,884,587, Cl. 403-14.000.

Caldwell, Roland B., to Ranco Incorporated. Exhaust gas recirculation control system for internal combustion engines. 3,884,200, Cl. 123-119.00A.

Calgon Corporation: *See—*
Grant, Richard John, 3,884,830.

California Institute of Technology: *See—*
Griffith, George A., 3,884,081.
Hurd, William J., 3,885,139.

Callais, Richard T.; and Warther, D. Paul, to Hughes Aircraft Company. Television scrambling system. 3,885,089, Cl. 178-5.100.

Callaway, Mel, to Yamaha International Corporation. Snowmobile ski suspension system. 3,884,314, Cl. 180-9.540.

Camara, Elias Humberto: *See—*
Fleming, Donald Kingsley; Randhava, Sarabjit Singh; and Camara, Elias Humberto, 3,884,838.

Cambridge Chemical Products, Inc.: *See—*
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Cammarata, Peter S.: *See—*
Aspinall, Richard L.; and Cammarata, Peter S., 3,885,041.

Campbell, Eldo L. Slack adjuster hitch for motor vehicles. 3,884,504, Cl. 280-446.00R.

Campbell, Leonard Earl, Jr. Work-shift indicator. 3,883,970, Cl. 40-110.000.

Campbell, Robert T.; Ritter, Laurence B.; and Land, Joseph G., Jr., to International Paper Company. Single vessel wood pulp bleaching with chlorine dioxide followed by sodium hypochlorite or alkaline extraction. 3,884,752, Cl. 162-89.000.

Campbell, Robert W.: *See—*
Scoggins, Lacey E.; and Campbell, Robert W., 3,884,884.

Camprubi, Anselmo Bolea. Devices for the actuation of lances in looms without shuttles. 3,884,275, Cl. 139-123.000.

Canadian Marconi Company: *See—*
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Canadian Patents and Development Limited: *See—*
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Canon Kabushiki Kaisha: *See—*
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Suwa, Michiharu; Tajima, Akira; Shimazaki, Mamoru; and Hirata, Noritsugu, 3,884,555.
Tsunekawa, Tokuichi; and Uchiyama, Takashi, 3,884,584.

Capulli, Giuseppe; DeSant, Gasparino Jose; DeCarvalho, Theodoro; and Beltrao, Helio Marcos Penna. System for purification of gases. 3,884,653, Cl. 55-223.000.

Carborundum Company, The: *See—*
Cottis, Steve G.; Economy, James; and Wosilait, Arnold A., 3,884,876.

Carlson, Richard W.; and Nesty, Glenn A., to International Paper Company. Carton handle. 3,884,411, Cl. 229-17.00G.

Carlstrom, Borge Ingmar: *See—*
Schetty, Rudolf; and Carlstrom, Borge Ingmar, 3,884,269.

Carman, Alva G. Apparatus for producing patterned objects out of plastic material. 3,884,104, Cl. 83-171.000.

Carpentier, Jan Albert: *See—*
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Carpentier, Richard A.; Di Matteo, Paul L.; Stern, Howard K.; and Wittke, Ernest C. Methods and apparatus for object reproduction. 3,884,577, Cl. 355-77.000.

Carre, Christian: *See—*
Rebours, Albert; and Carre, Christian, 3,884,657.

Carts, Stanley L., Jr., to United States of America, Army. Microchannel imaging display device. 3,885,180, Cl. 313-103.000.

Cascade Pacific Rim Co., Inc.: *See—*
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Caspar, Donald L. D.: *See—*
Schoenborn, Benno P.; and Caspar, Donald L. D., 3,885,153.

Castoldi, Fabrizio; Cattaneo, Serrio; and Niccolai, Adriano, to Honeywell Information Systems Italia. Asynchronous serial printer. 3,884,339, Cl. 197-53.000.

Castro, Rodolfo: *See—*
Tarbox, John W.; Hinds, Walter E.; Castro, Rodolfo; and Bell, Raymond C., 3,885,161.

Catallo, Frank; and Foreman, Donald. Spreader for use with compressive shrinking machines for tubular knit fabrics. 3,883,935, Cl. 26-55.00R.

Caterpillar Tractor Co.: *See—*
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Caton, Michael Peter Lear; Coffee, Edward Charles John; and Watkins, Gordon Leonard, to May & Baker Limited. Process for the preparation of cyclopentane. 3,884,942, Cl. 260-348.00A.

Cattaneo, Serrio: *See—*
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Cavallo, Elio; and Furlan, Fulvio, to Minnesota Mining and Manufacturing Company. Photographic materials having reduced static chargeability and method for their production. 3,884,699, Cl. 96-87.00A.

Caywood, Stanley William, Jr., to du Pont de Nemours, E. I., and Company. Certain EPDM copolymer/maleic anhydride adducts and thermoplastic elastomers therefrom. 3,884,882, Cl. 260-78.40D.

Cecil Equipment Co., Inc.: *See—*
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Celanese Corp.: *See—*
Dodson, Keith D.; and Squires, Thomas G., 3,884,870.

Cella, John A.; and Schmitt, William H., to Alberto-Culver Company. Fluoride-containing toothpaste. 3,885,028, Cl. 424-52.000.

Celmer, Walter D.; Cullen, Walter P.; and Routien, John B., to Pfizer Inc. Production of rifamycin S and rifamycin SV by micromonospora chalcea. 3,884,763, Cl. 195-96.000.

Censoni, Giustino: *See—*
Bianchini, Pietro; Vitale, Eupremio; Guerra, Guido; and Censoni, Giustino, 3,884,939.

Center For New Product Development: *See—*
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Centre d'Etude de l Energie Nucleaire, C.E.N.: *See—*
Wurm, Joseph Gerard; Van Impe, Jean; De Coninck, Antoine; Heylen, Paul Raymond; and Rombaux, Jean-Pierre, 3,884,784.

Centre National d'Etudes Spatiales: *See—*
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Centre National pour l'Exploitation des Oceans: *See—*
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Certain-teed Products Corporation: *See—*
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Ceskoslovenska akademie ved: *See—*
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Chacon, Julian, to Lightcraft of California. Multiple lighting fixture display system. 3,885,147, Cl. 240-9.00R.

Chailer, John D. Wall outlet and switch box hole cutter. 3,884,280, Cl. 144-73.000.

Chalabian, Jack S., to K-Jack Engineering Company, Inc. Coin operated vending apparatus with door operated coin return & pawls therefore. 3,884,330, Cl. 194-59.000.

Chalton Electronic Services Limited: *See—*
Massie, Kenneth Herbert; and Chalton, Gordon Alfred, 3,884,187.

Chalton, Gordon Alfred: *See—*
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Champeaux, Albert. Puppet like dummy. 3,883,984, Cl. 46-22.000.

Chandler, Edmond A., to Breveteam S.A. Thermoplastic net. 3,885,074, Cl. 428-136.000.

Chandross, Edwin Arthur: *See—*
Bowden, Murrae John Stanley; and Chandross, Edwin Arthur, 3,884,696.

Channel Creasing Matrix, Inc.: *See—*
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Chao, Kwei C.: *See—*
Ridgway, John A., Jr.; and Chao, Kwei C., 3,885,050.

Chaplin, Merle P. Harvesting marine growths and packaging the treated product. 3,884,018, Cl. 56-9.000.

Chapman, John C., to Avery Products Corporation. Self-adhesive closure. 3,885,070, Cl. 428-42.000.

Chapman, Ronald, to Canadian Patents and Development Limited. Vacuum gage. 3,884,080, Cl. 73-399.000.

Charles, Christian: *See—*
Lepetit, Marcel; Charles, Christian; Nonnet, Jean; and LeFoll, Francois, 3,884,518.

Charles, Hickel, to Compagnie Industrielle des Piles Electroniques "CIPEL". Convertible display device and packing-box for articles. 3,884,349, Cl. 206-44.00R.

Chas. Taylor's Sons Company, The: *See—*
Downing, Howard Leroy; and Roudabush, Ned Wright, 3,885,005.

Chattaway, George Anthony; and Pearson-Coleman, Arthur James, to Vortex (Fishery Equipment) Ltd. Filter. 3,884,811, Cl. 210-169.000.

Check, Donald R., to Olin Corporation. Ski boot with adjustable instep plate. 3,883,964, Cl. 36-2.5AL.

Chemplex Company: *See—*
Pullukat, Thomas J.; Shida, Mitsuzo; and Gillilan, Robert L., 3,884,832.

Cheng, Shu-Sing, to Kendall Company, The. Flow measuring apparatus having a colorimetric urine indicator. 3,884,072, Cl. 73-215.000.

Chernov, Evgeny Alexandrovich; Poletaev, Arkady Nikolaevich; Golod, Saul Vulfovich; Petrov, Evgeny Vasilievich; Vasiliev, Dmitry Timofeevich; and Tofpenets, Vitold Antonovich. Metal-cutting machine for machining locating surfaces. 3,884,122, Cl. 90-58.00C.

Chevron Research Company: *See—*
Adams, John Howard, 3,884,959.
Magee, Philip S., 3,885,032.

Childers, Warren, to Graphic Arts Mfg. Co., Inc. Process camera monotoring apparatus. 3,884,575, Cl. 355-68.000.

Chioffi, Mario: *See—*
Bertozzi, Marcello; and Chioffi, Mario, 3,884,088.

Christ, Alfred; and Lehmann, Rolf, to Escher Wyss Limited. Calendar having adjustable brake means. 3,884,140, Cl. 100-163.00R.

Christoffer, Virgil F. Apparatus for drilling aligned holes. 3,884,593, Cl. 408-16.000.

Christoph, Rudolf: *See—*
Tschesche, Harald; Fritz, Hans; and Christoph, Rudolf, 3,885,012.

Christy, Marcia E., to Merck & Co., Inc. 12-Cyano-5,6,7,12-tetrahydrodibenzo[a,d]cyclooctenes. 3,884,954, Cl. 260-465.00R.

Chrysler Corporation: *See—*
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Chu, David C., to Hewlett-Packard Company. Spectrum shaping with parity sequences. 3,884,546, Cl. 350-3.500.

Chu, Gordon P. K., to GTE Sylvania Incorporated. Lamp having light diffusing envelope. 3,885,182, Cl. 313-116.000.

Ciba-Geigy AG: *See—*
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Hoster, Hansruedi; and Milicevic, Branimir, 3,884,626.
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Ciba-Geigy Corporation: *See—*
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Cincinnati Milacron Chemicals, Inc.: *See—*
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Cintron, Roberto, to Computer Specifics Corporation. Data transmission system. 3,885,217, Cl. 325-26.000.

Ciosek, Stanley J.: *See—*
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Cities Service Oil Service Company: *See—*
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Citizen Watch Co., Ltd.: *See—*
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Claeson, Karl Goran: *See—*
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Clairol Incorporated: *See—*
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Clary, Henry James. Cast spoke wheel. 3,884,527, Cl. 301-65.000.

Clendenen, Ronald L.; Olson, Eugene E.; and Schlaudt, Charles M., to Shell Oil Company. Ceramic permanent magnet. 3,884,823, Cl. 252-62.630.

Cliffgard, Arnie L. Engine RPM control system. 3,884,203, Cl. 123-118.000.

Clipper, Donald W.: *See—*
Norfleet, James; and Clipper, Donald W., 3,885,029.

Closmann, Philip J., to Shell Oil Company. Vertically expanded structure-biased horizontal fracturing. 3,884,303, Cl. 166-308.000.

Cloyd, Harold S., to Nosco Plastics, Incorporated. Container. 3,884,384, Cl. 220-94.00A.

Cluchat, Jacques: *See—*
Pruvost, Pierre; and Cluchat, Jacques, 3,884,847.

Clynch, Frank. Remotely activated valve. 3,884,261, Cl. 137-488.000.

Coffee, Edward Charles John: *See—*
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Cohen, Georges: *See—*
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Cohly, Mauj A., to Tee-Pak, Inc. Edible collagen casing cross-linked by bisulfite addition. 3,885,054, Cl. 426-277.000.

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Coira Castro, Patricio. Mechanism for varying the distance between cages movable in an endless path. 3,884,371, Cl. 214-16.1BB.

Cole, Edward L.: *See—*
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Cook, Raymon W., to Ray Cook Golf Putters, Inc. Golf club. 3,884,468, Cl. 273-78.000.
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Corboy, John Francis; Cullen, Glenn Wherry; and Pastal, Nicholas, to RCA Corporation. Dual growth rate method of depositing epitaxial crystalline layers. 3,885,061, Cl. 117-201.000.
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Cotrel, Claude; Jeanmart, Claude; and Messer, Mayer Naoum, to Rhone-Poulenc, S.A. Isoindoline derivatives. 3,884,921, Cl. 260-268.0BQ.
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De Bie, Edouard, to Metallurgie Hoboken-Overpelt. Automatically controlling the oxygen content in copper and copper alloys. 3,884,680, Cl. 75-72.000.

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Dietsch, Jacques J. G., to Societe Anonyme des Etablissements Leon Hatot. Quartz synchronised clockwork. 3,884,034, Cl. 58-28.00A.
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Duy, Thuoc Nguyen; Palz, Wolfgang; and Vedel, Jacques, to United States of America, Navy. Method of manufacturing cadmium sulphide photocells. 3,885,058, Cl. 427-10.000.

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Eberle, Gunter F., to Vecta Group, Inc., The. Cantilevered seating means. 3,884,524, Cl. 297-160.000.

Eberly, Paul E.; Cull, Neville L.; Buchmann, Fred J., deceased; and Buchmann, Cordelia Atkeson, legal representative, to Exxon Research & Engineering Company. Process catalyst. 3,884,834, Cl. 252-439.000.

Eckert, Charles F.; and Pinkowski, Norman J., to Uniroyal, Inc. Bonding EPDM rubber to general purpose butadiene polymer rubber. 3,884,895, Cl. 260-94.20R.

Economy, James: *See—*
Cottis, Steve G.; Economy, James; and Wosilait, Arnold A., 3,884,876.

Ecothermia, Inc.: *See—*
Wartes, Lloyd Lore, 3,884,217.

Eddy, Kenneth Harmon, to Dresser Industries, Inc. Vertical connecting hose support. 3,884,311, Cl. 173-57.000.

Eddy, Robert T., to Reliance Electric Company. Hydraulic device. 3,884,124, Cl. 91-487.000.

Edge, Charles K.; and Kunkle, Gerald E., to PPG Industries, Inc. Flat glass manufacturing apparatus and method. 3,884,665, Cl. 65-99.00A.

Edo-Aire Mitchell Industries, Inc.: *See—*
Youkin, James R., 3,883,957.

Edwards, Thomas C., to Rovac Corporation, The. Throttle valve arrangement for noise control in compressor-expander. 3,884,664, Cl. 62-296.000.

Eggers, Frederick W.: *See—*
Lang, William J.; Brewer, Gerald K.; Fritz, Richard B.; and Eggers, Frederick W., 3,885,226.

Egli, Christian: *See—*
Schlunke, Hans-Peter; and Egli, Christian, 3,884,918.

Eichinger, Frithjof: *See—*
Pearce, Jai K.; and Eichinger, Frithjof, 3,884,453.

Eicke, Hans; Arnold, Vladimir; and L'Eplattenier, Francois, to Ciba-Geigy Corporation. Process for the manufacture of metal complexes in a pure form. 3,884,949, Cl. 260-429.300.

Eiglmeier, Kurt; and Lubbers, Henning, to Hoechst Aktiengesellschaft. Process for the preparation of acenaphthene-5,6-dicarboxylic acid imide. 3,884,924, Cl. 260-281.000.

Eisemann, Kurt, to U.S. Philips Corporation. Device for lifting and lowering a pick-up arm of a record player. 3,884,481, Cl. 274-23.00R.

Electron Optical Research and Technology Corporation: *See—*
Heinemann, Klaus, 3,885,157.

Elfers, Gunther H.: *See—*
Otrhalek, Joseph V.; and Elfers, Gunther H., 3,884,964.

Elias, Jack J.; and Tieri, Joseph C., to Leisure Dynamics, Inc. Foot-operated juvenile vehicle. 3,884,501, Cl. 280-251.000.

Elitex, Zavody textilniho strojirenstvi generalni reditelstvi: *See—*
Pavlica, Zdenek, 3,884,273.

Elmer, Bruce Leslie, to Lianco Container Corporation. Apparatus for counting can ends. 3,885,135, Cl. 235-98.00R.

Eltra Corporation: *See—*
Badger, John P.; and Bernholtz, Herbert A., 3,884,724.

Emeriat, Raymond, to Regie Autonome des Transports Parisiens. Element for a transporter having a variable speed. 3,884,152, Cl. 104-25.000.

Endo, Katutsohi: *See—*
Matsuo, Kazunori; Suzuki, Kohji; and Endo, Katutsohi, 3,884,824.

Endo, Tomio: *See—*
Shimada, Fumitaka; Ikekawa, Tetsuro; Endo, Tomio; Kuroda, Hideo; Ikeda, Yoshiaki; Tachibana, Kooichi; and Okazaki, Yoshimi, 3,884,911.

Enercon Corporation, The: *See—*
Helmer, Robert, 3,885,205.

Eng, Jeffrey D.; and Harke, Cyril J., to Hooker Chemicals & Plastics Corp. Electrolytic production of hydrogen peroxide and alkali metal hydroxide. 3,884,778, Cl. 204-84.000.

Eng, Jeffrey D.: *See—*
Harke, Cyril J.; and Eng, Jeffrey D., 3,884,777.

Engel, Stewart L. Tire chain. 3,884,283, Cl. 152-213.00A.

Engels, Kaspar, to Draiswerke GmbH. Continuously operating measuring device for pourable materials. 3,884,313, Cl. 177-119.000.

England, Harold H. Appliance and furniture floor skis. 3,883,923, Cl. 16-42.000.

English Electric Valve Company Limited: *See—*
Esterson, Maurice; King, Robin Charles Moorehouse; and Gregory, John Frederick, 3,885,192.
Lewis, Peter Frederick, 3,885,221.
Menown, Hugh; and Jones, Eric, 3,885,183.

Ens, Lawrence A., to Dow Chemical Company, The. Improved process for preparing chloromethyl methyl ether. 3,884,982, Cl. 260-614.00R.

Erco Industries Limited: *See—*
McGilvery, James D., 3,884,792.

Erickson, Frederick E., to Gulf and Western Industries, Inc. Reset timer/counter unit. 3,885,136, Cl. 235-144.0ME.

Erickson, Linwood P., to G. W. Dahl Co., Inc. Low profile control valve actuator. 3,884,446, Cl. 251-61.400.

Eriksson, Alf A. A., to Aktiebolaget Svenska Precisionsvertyg. Screw thread cutting apparatus. 3,884,334, Cl. 192-56.00R.

Eriksson, Bengt Herman, to AB R. W. Nissen. Protective seat cover of thin plastics film or sheet, a package for the protective seat cover and like thin plastics articles, and a process of making the package. 3,884,355, Cl. 206-494.000.

Ernst, Max. Coupling-uncoupling means using a lever operated by an axle-mounted disc. 3,884,360, Cl. 213-75.0TC.

Ernstsson, Georg E.; and Martensson, Kjell H., to Tetra Pak Developpement SA. Method and apparatus for the packing under aseptic conditions of sterile goods into containers. 3,884,012, Cl. 53-22.00A.

ESB Incorporated: *See—*
Armstrong, John, 3,884,720.

Escher Wyss Limited: *See—*
Christ, Alfred; and Lehmann, Rolf, 3,884,140.
Lehmann, Rolf, 3,884,141.

Estaulissements Genoud & Cie: *See—*
Neyret, Guy, 3,884,618.

Esterson, Maurice; King, Robin Charles Moorehouse; and Gregory, John Frederick, to English Electric Valve Company Limited. Fundamental coupled travelling wave tube having a periodic permanent magnetic focussing structure. 3,885,192, Cl. 315-3.500.

Estradier, Francoise: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,884,625.

Etablissements Genoud & Cie Societe Anonyme: *See—*
Neyret, Guy, 3,884,616.

Ethyl Corporation: *See—*
Lowrance, Byron R., 3,885,025.
Marsee, Frederick J., 3,885,004.

Evangelos, George D. Exerciser. 3,884,464, Cl. 272-79.00R.

Evans, James King; and Mills, Roy, to Fox, John C., a part interest. Microtome with rotating knife. 3,884,563, Cl. 352-131.000.

Evans, Richard C.; Heine, Murray A.; and Ciosek, Stanley J., to Olin Mathieson Chemical Corporation. Battery. 3,884,719, Cl. 136-90.000.

Ex-Cell-O Corporation: *See—*
Czubak, Albin S., 3,884,789.

Exxon Nuclear Company Inc.: *See—*
Levy, Ira S., 3,884,728.

Exxon Research & Engineering Company: *See—*
Beers, Ronald W.; and Lakritz, Julian, 3,884,863.
Bodnick, Sheldon; and Stark, Thomas M., 3,884,044.
Daniher, Francis A.; and Oswald, Alexis A., 3,884,963.
Eberly, Paul E.; Cull, Neville L.; Buchmann, Fred J., deceased; and Buchmann, Cordelia Atkeson, legal representative, 3,884,834.
Oswald, Alexis A., 3,884,951.
Stark, Thomas M.; and Bodnick, Sheldon, 3,884,045.
Stenmark, Donald G.; and Heinrich, Raymond L., 3,884,451.

Eyelet Specialty Co., Incorporated: *See—*
Landen, William James, 3,884,379.

F. Jos. Lamb Company: *See—*
Skrentner, Frank C.; and Willuweit, Werner W., 3,884,590.

F. Kuppersbusch & Sohne Aktiengesellschaft: *See—*
Lohr, Alfred; Tschek, Wolfgang; Forster, Heinz; Klauk, Bernhard; and Schwan, Wolfgang, 3,884,135.

Fabricius, John H., to Sprague Electric Company. Positive temperature coefficient resistor heater. 3,885,129, Cl. 219-553.000.

Fabula, Andrew G., to United States of America, Navy. Suppression of cable strumming vibration by a ridged cable jacket. 3,884,173, Cl. 114-235.00F.

Factory Mutual Research Corporation: *See—*
Livingston, William L., 3,884,305.

Falatok, Andrew: *See—*
Kunak, Anthony F.; and Falatok, Andrew, 3,884,743.

Falbo, Richard R.: *See—*
Cable, John A.; Cable, Stephen J.; and Falbo, Richard R., 3,884,619.

Falconio, Robert R., to Firestone Tire & Rubber Company, The. Inorganic zinc salts as color stabilizers for acrylonitrile vinyl chloride dyesite containing copolymers. 3,884,872, Cl. 260-45.75W.

Faleij, Karl Erik. Device for the fixation of joint sealing strips. 3,884,000, Cl. 52-127.000.

Faltin, Hans G., to Advance Enterprises, Inc. Three knife trimming machine. 3,884,102, Cl. 83-155.000.

Fanelli, Anthony Joseph; and Rauch, Francis Clyde, to American Cyanamid Company. Rhodium catalyst for hydration of acrylonitrile. 3,884,975, Cl. 260-561.00N.

Fannin, Chester N.: *See—*
Walther, William D.; and Fannin, Chester N., 3,884,332.

Faria, Carmen V. Folding table. 3,884,159, Cl. 108-112.000.

Fariss, Robert H.; and Snelgrove, James A., to Monsanto Company. Plasticized polyvinyl butyral interlayers. 3,884,865, Cl. 260-31.80R.

Farmer, Charles C.: *See—*
Bergin, William P.; and Farmer, Charles C., 3,885,134.

Farrell, Theodore, to Lawrence Peska Associates, Inc. Long handled shears. 3,883,951, Cl. 30-226.000.

Farrington, Gerrald K.: *See—*
Weir, Robert M.; Fester, Edward R.; and Farrington, Gerrald K., 3,884,493.

Fegraus, Clark E.; and Sundahl, Jimmy G., to Automotive Environmental Systems, Inc. Annular flow heat exchanger. 3,884,297, Cl. 165-145.000.

Fehlman, William L.: *See—*
Saullo, James W.; Fehlman, William L.; and Grosser, Harry W., 3,883,953.

Fehr, Eric R.: *See—*
Wolfson, Gerald; and Fehr, Eric R., 3,885,095.

Feier, Gunter: *See—*
Brenner, Wolfgang; Feier, Gunter; and Vinnemann, Antonius, 3,884,272.

Feist, Wolfgang: *See—*
Picker, Amos; and Feist, Wolfgang, 3,885,189.

Fengler, Richard R.: *See—*
Fengler, Werner H.; and Fengler, Richard R., 3,884,483.

Fengler, Werner H.; and Fengler, Richard R. Annular seal for coaxial tubular members. 3,884,483, Cl. 277-208.000.

Ferch, Alois. Valve stem guide for internal combustion engines. 3,884,210, Cl. 123-188.0GC.

Fernsler, Ronald Eugene, to RCA Corporation. Fail-safe high voltage protection circuit. 3,885,201, Cl. 317-51.000.

Ferrante, Elmer A., to Ferrante, Elmer A.; LaBarba, Frank; and Ricci, Alexander D., part interest to each. Composite slate structure. 3,885,075, Cl. 428-150.000.

Ferrentino, Antonio, to Industrie Pirelli Societa per Azioni. Fully-filled telephone cable with improved screen. 3,885,088, Cl. 174-102.00D.

Fessler, Andreas; and Fessler, Ewald, to Hochland, Reich, Summer & Co. High-duty cheese-slicing machine. 3,884,105, Cl. 83-419.000.

Fessler, Ewald: *See—*
Fessler, Andreas; and Fessler, Ewald, 3,884,105.

Fester, Edward R.: *See—*
Weir, Robert M.; Fester, Edward R.; and Farrington, Gerrald K., 3,884,493.

Fiber Industries, Inc.: *See—*
Ostrowski, Henry S., 3,884,850.

Fichter, Arthur A., Jr.; Danks, Ronald D.; Larsen, Farrell G.; and Throner, Guy C., Jr., to FMC Corporation. Method of providing a fluid tight seal between a thin walled tube and a piston. 3,883,942, Cl. 29-446.000.

Fideldy, William C. Pipe tongs. 3,884,100, Cl. 81-367.000.

Fields, John G. Magnetically Operated Amusement Device. 3,883,988, Cl. 46-239.000.

Filipe, Antonio Domingos. Method and apparatus for accelerated freeze drying. 3,883,958, Cl. 34-5.000.

Findlay, Peter Michael; Shelton, William Ewart Alan; and Klee, John Michael, to Bentley Engineering Co., Ltd., The. Tubular knitted fabrics. 3,884,052, Cl. 66-187.000.

Fiori, Bart J.: *See—*
McGovern, Terrence P.; Beroza, Morton; and Fiori, Bart J., 3,884,937.

Firestone Tire & Rubber Company, The: *See—*
Falconio, Robert R., 3,884,872.

Firmenich S.A.: *See—*
Dietrich, Paul; and Sundt, Erling, 3,884,247.

Fischer, Albert G., to United States of America, Army. Pocketable direct current electroluminescent display device addressed by MOS or MNOS circuitry. 3,885,196, Cl. 315-169.0TV.

Fish, Donald D.: *See—*
Armstrong, Leonard O.; and Fish, Donald D., 3,884,212.

Fish, Harold D.; and Kalberer, Karl H., to Halliburton Company. Method and apparatus for pipeline inspection. 3,885,091, Cl. 178-6.000.

Fisher, Raymond E.: *See—*
Butler, Lee D.; Fisher, Raymond E.; and Fontrier, Albert D., 3,884,367.

Fisher, Robert E.; and Matejcic, Leonard S., to Vervcraft, Inc. Sectional small water craft. 3,883,909, Cl. 9-2.00S.

Fitzgerald, James Allen: *See—*
Bice, Archie Robert; Fitzgerald, James Allen; and Hoover, Alan Ellsworth, 3,884,881.

Flambeau Products Corporation: *See—*
Hellman, Werner, 3,884,490.

Flanagan, James J.: *See—*
Anderson, John W.; Barney, John J.; Flanagan, James J.; and Krupa, Vernon, 3,884,611.

Flatt, Richard P., to RTE Corporation. Pressure actuated electrical bypass circuit for a high voltage bushing. 3,884,542, Cl. 339-111.000.

Fleischhauer, Eugene T. Vacuum cleaners. 3,883,922, Cl. 15-327.00R.

Fleischhauer, Eugene T.: *See—*
Walter, Henry J.; and Fleischhauer, Eugene T., 3,885,127.

Fleming, Donald Kingsley; Randhava, Sarabjit Singh; and Camara, Elias Humberto, to Institute of Gas Technology. Ruthenium-reduced amorphous tungsten oxide catalyst. 3,884,838, Cl. 252-470.000.

Fletcher, John Malcolm: *See—*
Romanski, Andrezej Antoni Florian; Allen, Michael John; Fletcher, John Malcolm; Laing, Ian Burnett; and Markham, Harry, 3,884,840.

Flex-Kleen Corporation: *See—*
Ray, Frank M., 3,884,659.

Floris, Telemaco: *See—*
Girotti, Pierleone; Tesei, Renato; and Floris, Telemaco, 3,884,988.

Fluegal, Dale A., to Phillips Petroleum Company. Buffered multiplexer with differential amplifier. 3,885,220, Cl. 330-30.00R.

Fluidfire Development Limited: *See—*
Virr, Michael John, 3,884,617.

Flutie, Richard Edward; and Belcher, Richard William, to Harris Corporation. Specimen block and specimen block holder. 3,885,158, Cl. 250-440.000.

FMC Corporation: *See—*
Avramidis, Stellios Antony, 3,884,089.
Avramidis, Stellios Antony; and Craig, John L., 3,884,097.
Fichter, Arthur A., Jr.; Danks, Ronald D.; Larsen, Farrell G.; and Throner, Guy C., Jr., 3,883,942.
Knight, Houston W., 3,884,251.
Montgomery, Ronald Eugene; and Incho, Harry Hobart, 3,885,031.
Nemschoff, Mark S., 3,884,322.

FMN Schuster & Co.: *See—*
Hermanns, Peter, 3,884,426.

Fontrier, Albert D.: *See—*
Butler, Lee D.; Fisher, Raymond E.; and Fontrier, Albert D., 3,884,367.

Foreman, Donald: *See—*
Catallo, Frank; and Foreman, Donald, 3,883,935.

Forster, Franz; and Stuhr, Hans-Waldemar, to Linde Aktiengesellschaft. Control system for a prime mover connected to a stepless transmission. 3,884,038, Cl. 60-431.000.

Forster, Heinz: *See—*
Lohr, Alfred; Tschek, Wolfgang; Forster, Heinz; Klauk, Bernhard; and Schwan, Wolfgang, 3,884,135.

Forte, Robert L., to Anchor Hocking Corporation. X-Shaped Carton. 3,884,353, Cl. 206-426.000.

Fortner, Edwin E.: *See—*
Anderson, Thomas R.; and Fortner, Edwin E., 3,884,042.

Fortsch, William A., to Thomas & Betts Corporation. Cable clamp assembly. 3,883,929, Cl. 24-132.00R.

Foster Grant Co., Inc.: *See—*
Bloch, Jack, 3,884,357.
Kodys, Edmund, 3,884,561.

Foster Wheeler Corporation: *See—*
Bryers, Richard W., 3,884,193.

Fox, John C.: *See—*
Evans, James King; and Mills, Roy, 3,884,563.

Fox, Leonard J. Safety Ski. 3,884,315, Cl. 280-11.13K.

Foxbower, Gerald J.: *See—*
Foxbower, Jacob S.; and Foxbower, Gerald J., 3,883,907.

Foxbower, Jacob S.; and Foxbower, Gerald J. Metal beehive liner. 3,883,907, Cl. 6-1.000.

Fradenburg, Evan Albern, to United Aircraft Corporation. Variable length blade. 3,884,594, Cl. 416-87.000.

Franceschini, John B.; and Meltzer, Leonard, to Dynell Electronics Corporation. Air-bearing data transfer system. 3,885,131, Cl. 235-61.11E.

Francis, Robert Charles, to Deere & Company. Latching device. 3,883,927, Cl. 24-81.000.

Frankl and Kirchner: *See*—
Palloch, Herbert, 3,885,175.

Franklin, David M., to Computervision Corporation, The. Apparatus for high resolution projection printing. 3,884,573, Cl. 355-51.000.

Franklin Electric Co., Inc.: *See*—
Schaefer, Edward J., 3,884,385.

Franks, Lawrence A.; and Perry, James E. Press control switch. 3,885,165, Cl. 307-115.000.

Franz, William F.: *See*—
Hess, Howard V.; Cole, Edward L.; and Franz, William F., 3,884,751.

Frazee, James S.; and Jen, Timothy Yu-Wen, to SmithKline Corporation. Mandelamidocephalosporins with improved properties. 3,884,914, Cl. 260-243.00C.

Freeman, Richard B.: *See*—
Schmidt, Alfred W.; and Freeman, Richard B., 3,883,938.

Freeman Supply Company, The: *See*—
Burkert, Edward F., 3,884,708.

Freiman, Aaron: *See*—
Pinkowski, Norman J.; Freiman, Aaron; and Beiter, Charles B., 3,885,039.

Frespa AG: *See*—
Walle, Josua, 3,884,485.

Fried, John H.: *See*—
Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,885,038.

Friedel, Rudolf, to Siemens Aktiengesellschaft. X-ray tube. 3,885,179, Cl. 313-60.000.

Friend, Harry Frederick, to Pilkington Brothers Limited. Refractory Elements. 3,884,669, Cl. 65-343.000.

Fritz, Hans: *See*—
Tschesche, Harald; Fritz, Hans; and Christoph, Rudolf, 3,885,012.

Fritz, Richard B.: *See*—
Lang, William J.; Brewer, Gerald K.; Fritz, Richard B.; and Eggers, Frederick W., 3,885,226.

Fritzsch, Walter, to Dornier-System GmbH. Projection device for exposing spherical surfaces. 3,884,568, Cl. 353-62.000.

Fritzsche Dodge & Olcott Inc.: *See*—
Kulka, Kurt; and Zazula, Teodosij, 3,884,843.

Frohberger, Paul-Ernst: *See*—
Buttner, Gerhard; Klauke, Erich; Frohberger, Paul-Ernst; and Hammann, Ingeborg, 3,884,931.

Frohlich, Robert T.; Wright, John L.; and Blessington, Bruce A., to W. R. Grace & Co. Method of ventilating a roof system. 3,884,009, Cl. 52-741.000.

Frost, Arthur W., III., to GAF Corporation. Closed cycle paper sheet production. 3,884,755, Cl. 162-190.000.

Frost, Granger H. Vehicle for carrier and loading device. 3,884,404, Cl. 224-42.10B.

Frost, Richard A.: *See*—
Barber, Everett M.; Brandenburg, John T.; and Frost, Richard A., 3,884,037.

Fry, Jack E.; Gerard, Joseph C.; Hickman, Chester C.; and Hummel, John E., to Arbrook, Inc. Decontamination apparatus. 3,884,265, Cl. 137-565.000.

Fuchs, Hugo: *See*—
Hilt, Albrecht; Sander, Bruno; Hild, Willia; Fuchs, Hugo; and Schmidt, Franz, 3,884,867.

Fucik, Karel, to SPOFA, United Pharmaceutical Works. New bis-(4,7-dihydroxycoumarinyl-3-)-acetic acid. 3,884,940, Cl. 260-343.20R.

Fuji Kogyo Co., Ltd.: *See*—
Ohmura, Ryuichi, 3,883,978.

Fuji Photo Film Co., Ltd.: *See*—
Inuiya, Masafumi, 3,885,096.
Minagawa, Nobuhiko, 3,884,692.
Ozutsumi, Minoru; Miyazawa, Yoshihide; Motohashi, Katsuichi; Kiritani, Masatake; and Watanabe, Akio, 3,884,506.

Fuji Xerox Co., Ltd.: *See*—
Namba, Yoshiharu, 3,884,103.

Fujii, Takeshi: *See*—
Hirose, Isao; Funabashi, Kazutoshi; Fujii, Takeshi; and Kawajiri, Kiyoshi, 3,884,984.

Fujikura Cable Works, Ltd.: *See*—
Takada, Toshihisa; and Matsui, Yukio, 3,885,087.

Fujimoto, Yukio, to Uro Electronics Industries Co., Ltd. Ultrasonic wave type alarm device for depicting a moving object. 3,885,234, Cl. 340-258.00A.

Fujita, Isao: *See*—
Fukada, Tadayuki; and Fujita, Isao, 3,885,014.

Fujita, Masaaki: *See*—
Klein, Albert M.; and Fujita, Masaaki, 3,885,238.

Fujitsu Limited: *See*—
Hanabusa, Takayoshi; Isozuka, Hiroshi; Miyao, Kunioki; and Gaku, Morio, 3,884,771.

Fujiwara, Hiroshi: *See*—
Shimizu, Masaru; Fujiwara, Hiroshi; and Iwai, Shinji, 3,884,992.

Fukada, Tadayuki; and Fujita, Isao, to Kabushiki Kaisha Oji Yuka Goseishi. Production of fine fiber mass. 3,885,014, Cl. 264-205.000.

Fukase, Shigeo: *See*—
Kawabe, Ushio; Fukase, Shigeo; Ishibashi, Masato; Kudo, Mitsuhiro; and Takatoku, Kazue, 3,884,683.

Fukushima, Tsutomu: *See*—
Wenzel, Werner; Gudenau, Heinrich Wilhelm; and Fukushima, Tsutomu, 3,884,677.

Fukuura, Yukio: *See*—
Honda, Toshio; Ueki, Takehiro; and Fukuura, Yukio, 3,884,859.

Fullalove, Richard; and Spencer, Frederick, to Henry Simon Limited. Rollermills. 3,884,421, Cl. 241-230.000.

Fulton Boiler Works, Inc.: *See*—
Palm, Lewis J.; and Palm, Ronald B., 3,885,125.

Fumel, Florence, to Anvar Agence Nationale de Valorisation de la Recherche. Menu. 3,884,507, Cl. 283-60.000.

Funabashi, Kazutoshi: *See*—
Hirose, Isao; Funabashi, Kazutoshi; Fujii, Takeshi; and Kawajiri, Kiyoshi, 3,884,984.

Funaro, Ettore. Refrigerator system with refrigerant expansion through capillary tubes of adjustable length. 3,884,663, Cl. 62-222.000.

Furlan, Fulvio: *See*—
Cavallo, Elio; and Furlan, Fulvio, 3,884,699.

Furukawa Electric Co., Ltd., The: *See*—
Shiga, Shoji, 3,884,772.

G. D. Searle & Co.: *See*—
Aspinall, Richard L.; and Cammarata, Peter S., 3,885,041.

G. T. Schjeldahl Company: *See*—
Monahan, Thomas J., 3,884,129.

G. W. Dahl Co., Inc.: *See*—
Erickson, Linwood P., 3,884,446.

Gaddy, Thomas W.; and Wohlford, Larry H., to General Electric Company. Remote control circuit having light coupling. 3,885,231, Cl. 340-172.000.

Gaeddert, Melvin V.: *See*—
Holdeman, Adin F.; and Gaeddert, Melvin V., 3,884,377.

GAF Corporation: *See*—
Frost, Arthur W., III., 3,884,755.
Little, David C., 3,884,706.

Gainesville Manufacturing Co., Inc.: *See*—
Kightlinger, Neal B.; and Woodall, Rufus W., 3,883,933.

Gaku, Morio: *See*—
Hanabusa, Takayoshi; Isozuka, Hiroshi; Miyao, Kunioki; and Gaku, Morio, 3,884,771.

Gallagher, Raymond J.: *See*—
McNair, Robert Bruce; and Gallagher, Raymond J., 3,885,236.

Gallagher, Ronald V.; and Swanson, Robert R., to Western Electric Company, Inc. Apparatus for orienting articles having magnetic projections. 3,884,347, Cl. 198-254.000.

Gallaro, Anthony V.; and Hedler, Robert A., to GTE Sylvania Incorporated. Process for forming a color cathode ray tube screen structure having optical filter elements therein. 3,884,694, Cl. 96-30.000.

Gallaro, Anthony V.; and Hedler, Robert A., to GTE Sylvania Incorporated. Process for fabricating a color cathode ray tube screen structure having superimposed optical filter means therein. 3,884,695, Cl. 96-30.000.

Galliford, Edgar Horace: *See*—
Adams, Sidney George William; and Galliford, Edgar Horace, 3,883,916.

Gallion, Georg A.; Weichsler, Klaus; Hullmann, Horst; and Munzer, Horst, to General Motors Corporation. Motor vehicle with impact-damping bumper. 3,884,516, Cl. 293-69.000.

Gandon, Louis, to Le Nickel. Process for the production of high-purity metals from nickeliferous mattes. 3,884,681, Cl. 204-113.000.

Gankin, Viktor Judkovich; Rybakov, Vyacheslav Alexeevich; Rudkovsky, David Moiseevich, deceased; and Rudkovskaya, Galina Davydovna, administrator. Method of producing individual higher branched carboxylic acids. 3,884,948, Cl. 260-413.000.

Ganz, Rudolph V., to Affiliated Hospital Products, Inc. Glove. 3,883,899, Cl. 2-168.000.

Garcia, Adey M. Electrical back scratcher. 3,884,224, Cl. 128-63.000.

Garcia, Isaura A.: *See*—
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Gardner, Jeffrey M.: *See*—
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Garrett, Henry U., to Macco Oil Tool Co., Inc. Automatic safety valve. 3,884,300, Cl. 166-133.000.

Gassert, Willy, to Societe Legris France, S.A. Coupling for a pipe or tube. 3,884,513, Cl. 285-322.000.

Gay, Eddie C.; Shimotake, Hiroshi; Cairns, Elton J.; and Walsh, William J., to United States of America, America as represented by the Energy Research and Development Administration. Secondary electrochemical power-producing cells having mixed cathode composition. 3,884,715, Cl. 136-6.00F.

Geertz, Lloyd M., to Contraves-Goerz Corporation. Optical measuring apparatus. 3,885,162, Cl. 250-573.000.

Geiger, Rolf; Wissmann, Hans; and Langner, Dietrich, to Hoechst Aktiengesellschaft. Process for the manufacture of insulin, analogs and derivatives thereof. 3,884,897, Cl. 260-112.700.

Geleishvili, Tengiz Pavlovich: *See*—
Gogorishvili, Platon Vladimirovich; Geleishvili, Tengiz Pavlovich; Zarkua, Nina Porfirievna; Nikolishvili, Georgy Alexeevich; Dundua, Rusudan Georgievna; Svintidze, Nadezhda Georgievna; Onuchkina, Nina Ivanovna; Kasradze, Gaioz Grigorievich; and Kuperman, Genrikh Moiseevich, 3,883,908.

Gem Industries Inc.: *See*—
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Gemmill, Robert M., Jr., to Mobil Oil Corporation. Lubricant composition containing 3-amidopyridine corrosion inhibitor. 3,884,822, Cl. 252-51.50A.

General Atomic Company: *See—*
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General Cable Corporation: *See—*
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Jachimowicz, Ludwik; and Olszewski, Jerzy A., 3,885,083.

General Electric Company: *See—*
Barkan, Philip; and Oppel, John A., 3,885,113.
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Jeram, Edward M.; and Striker, Richard A., 3,884,866.
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General Signal Corporation: *See—*
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General Tire & Rubber Company, The: *See—*
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Genoud, Paul; and Bresson, Eugene, to Institut Francais du Petrole, des Carburants et Lubrifiants. Automatic safety dispensing mechanism for fluid or pulverulent material. 3,884,279, Cl. 141-156.000.

Geoffray, Jean-Pierre. Blow guns. 3,884,419, Cl. 239-526.000.

Gerard, Joseph C.: *See—*
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Gerber Scientific Instrument Company, The: *See—*
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Gerhards, Bernhard, to Kleinewefers Industrie-Companie GmbH. Plasticizing extrusion device employing worms. 3,884,607, Cl. 425-144.000.

Gerharz, Reinhold, to United States of America, Army. Invisible to visible light image converter. 3,884,552, Cl. 350-161.000.

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Gerzanich, Michael, to Lehara Equipment Co., Inc. Floatational front mounted mower assembly for power vehicles. 3,884,019, Cl. 56-12.700.

Gesellschaft fur Kernforschung mbH: *See—*
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Gill, Donald: *See—*
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Gilman, C. Malcolm B. Tourniquet. 3,884,240, Cl. 128-325.000.

Gindler, E. Melvin, to Pierce Chemical Company. Method and composition for the determination of albumin. 3,884,637, Cl. 23-230.00B.

Girardin, Michel: *See—*
Jeannet, Pierre Maurice; and Girardin, Michel, 3,884,035.

Girotti, Pierleone; Tesei, Renato; and Floris, Telemaco, to Snamprogetti S.p.A. Production of synthetic lubricants from alpha-olefins through a ternary catalytic system. 3,884,988, Cl. 260-683.15D.

Givens, James A., to Res-Q-Raft, Inc. Aquastabilized survival raft. 3,883,913, Cl. 9-11.00A.

GKN Group Services Ltd.: *See—*
Townend, Gordon Howard, 3,884,065.

Gleasman, Vernon E. Floating journal pin in multiple gear differential. 3,884,096, Cl. 74-715.000.

Go, Tadahiro; Yaginuma, Hiroshi; and Inoue, Masaaki, to Nippon Zeon Co., Ltd. Process for preparing liquid polymers. 3,884,712, Cl. 106-285.000.

Goehner, Ronald H., to Varian Associates. Photomultiplier tube having impact ionization diode collector. 3,885,178, Cl. 313-1.000.

Gogorishvili, Platon Vladimirovich; Geleishvili, Tengiz Pavlovich; Zarkua, Nina Porfirievna; Nikolishvili, Georgy Alexeevich; Dundua, Rusudan Georgievna; Svintidze, Nadezhda Georgievna; Onuchkina, Nina Ivanovna; Kasradze, Gaioz Grigorievich; and Kuperman, Genrikh Moiseevich. Method for preparing copper together with manganese sulphate. 3,883,908, Cl. 75-108.000.

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Golod, Saul Vulfovich: *See—*
Chernov, Evgeny Alexandrovich; Poletaev, Arkady Nikolaevich; Golod, Saul Vulfovich; Petrov, Evgeny Vasilievich; Vasiliev, Dmitry Timofeevich; and Tofpenets, Vitold Antonovich, 3,884,122.

Goodhue, Charles T.; Risley, Hugh A.; and Snoke, Roy E., to Eastman Kodak Company. Method and composition for blood serum cholesterol analysis. 3,884,764, Cl. 195-103.50R.

Goodinge, Mark Wallinger: *See—*
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Goodman, Jack. Sign. 3,883,973, Cl. 40-142.000.

Goodyear Tire & Rubber Company, The: *See—*
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Lederman, Jack M., 3,885,077.

Gordon, Robert L.; Cooper, Keith A.; and Siegele, John C., to International Paper Company. Cartridge type dispenser with resilient slitted outlet valve. 3,884,396, Cl. 222-327.000.

Gordos, Ambrose. Disintegrating golf tee. 3,884,479, Cl. 273-212.000.

Gorham Tool Company: *See—*
Diferdinando, Frank L., 3,884,120.

Goto, Tsugio, to Asahi Kasei Kogyo Kabushiki Kaisha. Apparatus for the treatment of yarn thickness variation signals. 3,885,232, Cl. 340-173.00R.

Grabman, Julia Maras. Drapery support member. 3,883,924, Cl. 16-94.00D.

Graff, Robert A.: *See—*
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Grammer, Willibad: *See—*
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Grant, Richard John, to Calgon Corporation. Controlled selectivity activated carbon. 3,884,830, Cl. 252-421.000.

Graphic Arts Mfg. Co., Inc.: *See—*
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Graser, Michael, Jr., to Technical Operations Incorporated. Optical display system with improved spectral efficiency. 3,884,553, Cl. 350-162.0SF.

Graves, Donald Burrell; and Maender, Otto William, to Monsanto Company. Manufacture of thioperoxydiphosphates. 3,885,001, Cl. 260-968.000.

Gravestock, Michael B.: *See—*
Johnson, William S.; Morton, Douglas R.; and Gravestock, Michael B., 3,884,945.

Gray & Bensley Research Corporation: *See—*
Gray, Herbert Lewis, 3,884,600.

Gray, Herbert Lewis, to Gray & Bensley Research Corporation. Guidance means for a rotary engine or pump. 3,884,600, Cl. 418-61.00A.

Gray, Peter R.; and Leroy, Billy J., to Phillips Petroleum Company. Preparation of iron carbide (Fe_3C). 3,885,023, Cl. 423-439.000.

Great Canadian Oil Sands, Ltd.: *See—*
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Grecenko, Alexandr: *See—*
Soucek, Josef; Brazda, Zdenek; and Grecenko, Alexandr, 3,884,310.

Green, Alan N., to Colt Industries Operating Corp. Explosively operated multi-circuit band switch including flexiable diaphragm bag contact. 3,885,223, Cl. 337-406.000.

Green, Charles J., Jr.; Treier, George; and MacClaren, Robert H., to Xerox Corporation. Low density paper used in transfer electrophotography. 3,884,685, Cl. 96-1.400.

Green, Derek, to United Kingdom Atomic Energy Authority. Forming of materials. 3,884,062, Cl. 72-60.000.

Green, Howard, to Massachusetts Institute of Technology. Triglyceride-accumulating clonal cell line. 3,884,758, Cl. 195-1.800.

Green, Lane A., to Superior Iron Works & Supply Company, Inc. Hydraulic actuator. 3,884,040, Cl. 60-593.000.

Green, William M. Fire extinguisher mechanism for a trailer. 3,884,308, Cl. 169-62.000.

Greene, Alfred A.: *See—*
Bradshaw, Robert S.; Greene, Alfred A.; Hunter, James R.; Lazzarotti, S. James; Mann, Abe; and Rosenblatt, Herbert L., 3,884,370.

Greenhalgh, Colin William, to Imperial Chemical Industries Limited. Disperse dyestuffs. 3,884,926, Cl. 260-289.0QP.

Gregory, John Frederick: *See—*
Esterson, Maurice; King, Robin Charles Moorehouse; and Gregory, John Frederick, 3,885,192.

Grelon, Pierre, to Lever Brothers Company. Manufacture of soap bars. 3,884,605, Cl. 425-131.100.

Gretener AG: *See—*
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Gretener, Albert, to Gretener AG. Spindle guide for a drawtwisting tube. 3,884,428, Cl. 242-118.300.

Gretzinger, Adolf: *See—*
Houston, Herbert James; Bolt, Kenneth Dale; Gretzinger, Adolf; and Baird, Robert Gordon, 3,885,086.

Griffith, George A., to California Institute of Technology. Automated sequential air sampler. 3,884,081, Cl. 73-421.50R.

Griffith, Joseph W. Reclamation of non-combustible liquids by direct flame vaporization, centrifugal solids separation and subsequent condensation. 3,884,768, Cl. 203-11.000.

Griffith, William A.; Day, Howard E.; Lefler, Clarence A.; and Cottam, Stephen M., to Hecla Mining Company. Recovering copper from acidic solutions by continuous cementation. 3,884,682, Cl. 75-109.000.

Grob, Theodore; and Tesker, Donald H. Rotary engine. 3,884,196, Cl. 123-8.410.

Groening, Franklin E.: *See—*
Sheppard, Robert S.; and Groening, Franklin E., 3,885,021.

Gros, Harold J., to Copolymer Rubber & Chemical Corporation. EPM and EPDM rubbers having improved processability. 3,884,993, Cl. 260-897.00A.

Grosseau, Albert, to Societe Anonyme Automobiles Citroen. Recovery of thermal energy from the exhaust gases of an internal combustion engine. 3,884,194, Cl. 122-7.00R.

Grosser, Harry W.: *See—*
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Grot, Walther Gustav, to du Pont de Nemours, E. I., and Company. Melt processing of fluorinated polymers. 3,884,885, Cl. 260-79.30R.

Grotheer, Morris P.: *See—*
Cook, Edward H., Jr.; and Grotheer, Morris P., 3,884,780.

Grouwinkel, George F.; and Hager, James W., to Moog Inc. Direct-acting two-way control valve. 3,884,267, Cl. 137-625.330.

Grybek, Roland S.; and Johnston, Frederick B., to Marketing and Research Services, Inc. Composition and method for treating plants and trees. 3,884,674, Cl. 71-113.000.

GTE Sylvania Incorporated: *See—*
Chu, Gordon P. K., 3,885,182.
Gallaro, Anthony V.; and Hedler, Robert A., 3,884,694.
Gallaro, Anthony V.; and Hedler, Robert A., 3,884,695.
Harris, Geoffrey Lyall; and Parsons, Donald S., 3,885,022.
Kelly, John L., Jr., 3,884,249.
Kerstetter, Donald R., 3,885,191.

Guaglione, Giovanni Paolo; and Aumayer, Hansruedi, to I-T-E Imperial Corporation. Gas circuit breaker stationary interrupter tube and contact support. 3,885,114, Cl. 200-148.00R.

Gudenau, Heinrich Wilhelm: *See—*
Wenzel, Werner; Gudenau, Heinrich Wilhelm; and Fukushima, Tsutomu, 3,884,677.

Guenther, Karl R.; and Paquette, Elmer G., to Bjorksten Research Laboratories, Inc. Package for bottles. 3,884,354, Cl. 206-427.000.

Guerra, Guido: *See—*
Bianchini, Pietro; Vitale, Eupremio; Guerra, Guido; and Censoni, Giustino, 3,884,939.

Guillot, Philippe: *See—*
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Gulf Research & Development Company: *See—*
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Gulf and Western Industries, Inc.: *See—*
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Gumpoltsberger, August, to BHS-Bayerische Berg Hutten-und Salzwerke Aktiengesellschaft. Planetary gear. 3,884,098, Cl. 74-801.000.

Gunn, David P.; and May, Fred, to Gunn-May Manufacturing, Inc. Sheet folding mechanism. 3,884,459, Cl. 270-61.00R.

Gunn-May Manufacturing, Inc.: *See—*
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Gurevich, Samuil Markovich: *See—*
Dudko, Daniil Andreevich; Alexeenko, Alexei Pavlovich; Lychko, Ivan Ivanovich; Iljushenko, Valentin Mikhailovich; Suschuk-Sljusarenko, Igor Ivanovich; Tarnovsky, Alexandr Grigorievich; Kostevich, Dmitry Nikolaevich; Andrusenko, Jury Iosifovich; Gurevich, Samuil Markovich; and Strakhov, Gennady Nikolaevich, 3,885,121.

Gurrey, Hartley B.: *See—*
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Gurrey, Richard B., to Gurrey, Richard B.; and Gurrey, Hartley B. Resiliently extensible, coiled leash. 3,884,190, Cl. 119-109.000.

Gustafson, David R., to Beloit Corporation. Multi-ply linerboard machine with vertical and horizontal forming runs. 3,884,756, Cl. 162-299.000.

Gutai, Jeno B., to Statham Instruments, Inc. Rechargeable battery-operated illuminating device. 3,885,211, Cl. 320-2.000.

Gutierrez, Julian. Folding table center leg structure. 3,884,160, Cl. 108-113.000.

Gutman, Arnold D.: *See—*
Baker, Don R.; and Gutman, Arnold D., 3,885,043.

H. Koch and Sons, Inc.: *See—*
Poehlmann, Paul W., 3,884,436.

Hage, Jacob M., to Midwest Chrome Process Company. Screw threaded fastening means and like products. 3,884,116, Cl. 85-1.00C.

Hagemann, Alfred: *See—*
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Hager, James W.: *See—*
Grouwinkel, George F.; and Hager, James W., 3,884,267.

Hahn, Steven, to Lynkeus Corporation, The. Intravenous feeding system. 3,884,228, Cl. 128-214.00F.

Hajto, Ernest Anthony: *See—*
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Halcon International, Inc.: *See—*
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Hallas, Robert; Martin, Jerry Roy; and Soloman, John, to Abbott Laboratories. Sulfonyl derivatives of erythromycin. 3,884,902, Cl. 260-210.00E.

Halliburton Company: *See—*
Fish, Harold D.; and Kalberer, Karl H., 3,885,091.

Halmar Electronics, Inc.: *See—*
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Hamai Denkyu Kogyo Kabushiki Kaisha: *See—*
Hamai, Jituo, 3,884,540.

Hamai, Jituo, to Hamai Denkyu Kogyo Kabushiki Kaisha. Manufacturing process for small bulbs. 3,884,540, Cl. 316-19.000.

Hamilton Brothers Oil Company: *See—*
Hamilton, Ferris F.; and Johnson, James S., 3,884,324.

Hamilton, Ferris F.; and Johnson, James S., to Hamilton Brothers Oil Company. Mounting for seismic vibrator. 3,884,324, Cl. 181-114.000.

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Hammann, Ingeborg: *See—*
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Lorenz, Walter; Jautelat, Manfred; Hammann, Ingeborg; and Homeyer, Bernhard, 3,884,996.
Schrader, Gerhard; and Hammann, Ingeborg, 3,884,999.

Hanabusa, Takayoshi; Isozuka, Hiroshi; Miyao, Kunioki; and Gaku, Morio, to Fujitsu Limited. Process of producing resinous board having a rough surface usable for firmly supporting thereon a printed circuit. 3,884,771, Cl. 204-12.000.

Hanamoto, Manabu: *See—*
Arakawa, Morimasa; Katanosaka, Akisato; Hanamoto, Manabu; and Ohtsubo, Jyunichiro, 3,884,970.

Hanas, Bertil, to Allmanna Svenska Elektriska Aktiebolaget. Electric arc furnace side-wall protection arrangement. 3,885,082, Cl. 13-35.000.

Handele, Martin Jacob: *See—*
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Hans List: *See—*
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Harbison, William H.; and Wubbe, Leo J., to Anderson Company, The. Blade connection structure to arm. 3,883,919, Cl. 15-250.320.

Harbison, William H.; Plisky, John J.; and Mohnach, Michael G., to Anderson Company, The. Bridge to link connection. 3,883,920, Cl. 15-250.420.

Hariter, Donald R., to du Pont de Nemours, E. I., and Company. Oxalyl cyanide. 3,884,878, Cl. 260-545.00R.

Harke, Cyril J.; and Eng, Jeffrey D., to Hooker Chemicals & Plastics Corp. Electrolytic process for manufacturing chlorine dioxide, hydrogen peroxide, chlorine, alkali metal hydroxide and hydrogen. 3,884,777, Cl. 204-84.000.

Harke, Cyril J.: *See—*
Eng, Jeffrey D.; and Harke, Cyril J., 3,884,778.

Harmony Enterprises, Inc.: *See—*
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Harper, James W. Multi-tiered game board for three-dimensional tic-tac-toe games. 3,884,474, Cl. 273-130.0AC.

Harper-Wyman Company: *See—*
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Harris Corporation: *See—*
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Harris, Gary R.: *See—*
Sweeney, William T.; and Harris, Gary R., 3,884,257.

Harris, Geoffrey Lyall; and Parsons, Donald S., to GTE Sylvania Incorporated. Method of producing boron carbide from water-alcohol solution of carbon source. 3,885,022, Cl. 423-291.000.

Harris-Intertype Corporation: *See—*
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Harrison, Ian Robert; McCarthy, John Felix; and Palmer, Bryan Harper, to Boots Pure Drug Company. N-2,4-dimethylphenyl-N'-methylformamidine compounds. 3,884,968, Cl. 260-501.140.

Harrison, Ian T.: *See—*
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Hartmann, Albert: *See—*
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Hartnett, Leo J. Method and apparatus for injecting X-ray contrast media for venography of the female pelvis. 3,884,220, Cl. 128-2.00A.

Hasegawa, Hirozo: *See—*
Sakata, Hiroshi; Asahara, Nakaba; Asai, Yasuhiko; and Hasegawa, Hirozo, 3,884,990.

Hashimoto, Kenzo; and Wada, Kimihiro, to Nishimura Seisakusho Co., Ltd. Apparatus for rewinding slitted film strips in a roll slitting and rewinding machine. 3,884,427, Cl. 242-56.200.

Haskell, Vernon C.; and Hecht, James L., to du Pont de Nemours, E. I., and Company. Phosphate coated polymeric shaped objects. 3,885,079, Cl. 428-346.000.

Hatano, Yoshio: *See—*
Hirai, Takako; Hatano, Yoshio; Nonogaki, Saburo; and Kobayashi, Teruaki, 3,885,060.

Hatch, Donald M.; Studdert, George M.; Williamson, John B.; and Wycinowski, Roger W., to Hitco. Composite friction articles and methods of making same. 3,885,006, Cl. 264-29.000.

Hauser, Frank W., to Telautograph Corporation. Facsimile drum feed. 3,884,461, Cl. 271-277.000.

Hay, Charles N., to General Motors Corporation. Pitman shaft axial self-adjusting device. 3,884,091, Cl. 74-499.000.

Hay, John, to Norton Company. Porous mullite refractory. 3,884,709, Cl. 106-65.000.

Hays, Ronald C.: *See—*
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Hazard, Robert E., to Polytop Corporation. Push-pull closure with probe to prevent clogging. 3,884,390, Cl. 222-149.000.

Hazard, Robert E., to Polytop Corporation. Child-resistant closure. 3,884,392, Cl. 222-153.000.

Hazard, Robert E., to Polytop Corporation. Container and container closure combined structure. 3,884,394, Cl. 222-153.000.

Hecht, James L.: *See—*
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Hecla Mining Company: *See—*
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Heddon, Merlyn W. Apparatus for skimming in multi-phase fluid media. 3,884,807, Cl. 210-104.000.

Hedler, Robert A.: *See—*
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Gallaro, Anthony V.; and Hedler, Robert A., 3,884,695.

Heffe, Wilhelm, to Sandoz Ltd. 2-Ketoamidines. 3,884,974, Cl. 260-564.00R.

Hehl, Karl. Machine element of surface-hardened steel having an improved resistance against wear, heat, and mechanical stress. 3,884,730, Cl. 148-12.400.

Heidenreich, Robert Darrow; and Thompson, Larry Flack, to Bell Telephone Laboratories, Incorporated. Electron beam generated patterns of metal-containing polymers. 3,885,076, Cl. 428-195.000.

Heightley, John Donnell, to Bell Telephone Laboratories, Incorporated. Storage-processor element including a bistable circuit and a steering circuit. 3,885,169, Cl. 307-246.000.

Heimbach, Paul: *See—*
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Heimberger, Helmut, to Opti-Holding AG. Method of making slide-fastener halves. 3,884,168, Cl. 112-265.000.

Heine, Murray A.: *See—*
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Heinemann, Helmut; and Rothe, Werner, to Boehringer Mannheim GmbH. Preparation of porous tablets. 3,885,026, Cl. 424-14.000.

Heinemann, Klaus, to Electron Optical Research and Technology Corporation. Electron beam image processing device. 3,885,157, Cl. 250-311.000.

Heinrich, Raymond L.: *See—*
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Heintz, Ralph M., Sr.: *See—*
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Henry Simon Limited: *See—*
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Hermanson, Dean E., to Youngstown Sheet and Tube Co. Nitrogen charged swivel joint. 3,884,511, Cl. 285-93.000.

Herr, Theodore Z.; and McClure, Daniel J., to Leigh Products Inc. Metal frame for doorways. 3,884,003, Cl. 52-212.000.

Herrick, David B., to Dresser Industries, Inc. Impeller and shaft assembly. 3,884,595, Cl. 416-198.000.

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Hickey, Roy E., to Singer Company, The. Slide tray and slide positioning mechanism for a rear-screen projector. 3,884,569, Cl. 353-88.000.

Hickey, William P. Tank, filter and deproteinator for marine life. 3,884,186, Cl. 119-3.000.

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Hilfman, Lee, to Universal Oil Products Company. Hydrocracking process using co-extruded nickel-on-silica-alumina. 3,884,798, Cl. 208-111.000.

Hilgert, Adolph J., to Johnson Service Company. Diaphragm valve apparatus and control systems employing such valve apparatus. 3,884,260, Cl. 137-469.000.

Hill, John; and Turczanski, Henryk, to Comtelco (U.K.) Limited. Reed switch manufacture. 3,883,949, Cl. 29-622.000.

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Hilt, Albrecht; Sander, Bruno; Hild, Willia; Fuchs, Hugo; and Schmidt, Franz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Self-extinguishing polyoxymethylene molding compositions reinforced with glass fibers. 3,884,867, Cl. 260-37.0AL.

Hinderliter, Charles R.; and Perrussel, Russell E., to United States of America, Interior. Solvent refined coal process with retention of coal minerals. 3,884,796, Cl. 208-8.000.

Hindin, Herbert B.; Johnson, Alfred E.; and Knapp, Donald P., to Oliver Tire & Rubber Company. Apparatus for simultaneously recapping a plurality of tires with precured tread rubber. 3,884,739, Cl. 156-96.000.

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Hofius, David V., Sr. Method and apparatus for fastening slide fasteners to an article. 3,884,738, Cl. 156-73.100.

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Holcomb, Donald E., to Cornelius Company, The. Mixing Device for a Beverage Dispenser. 3,884,388, Cl. 222-132.000.

Holdeman, Adin F.; and Gaeddert, Melvin V., to Hesston Corporation. Stack moving implement. 3,884,377, Cl. 214-767.000.

Holden, Kenneth G.; and Yim, Nelson C. F., to SmithKline Corporation. Process for the preparation of n-acyl-α-(2- and 4-hydroxy)arylglycine esters. 3,884,958, Cl. 260-471.00C.

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Hoppe, Peter; Drouven, Gustav; Leyer, Helmut; and Muller, Johann, to Bayer Aktiengesellschaft. Marginal zone reinforcing system for the production of heavy duty foam resin constructions. 3,884,169, Cl. 112-420.000.

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Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz-Wander, Inc. Bis-(substituted benzyl) malonic acid esters. 3,884,961, Cl. 260-475.0SC.

Houston, Herbert James; Bolt, Kenneth Dale; Gretzinger, Adolf; and Baird, Robert Gordon. Spacer-damper assembly. 3,885,086, Cl. 174-42.000.

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Howeth, Calvin Richard; and Dickey, Frank Angelo, to Howeth, Calvin Richard. Electronic ton-mile indicator. 3,884,071, Cl. 73-151.000.

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Ishida, Hiroaki; Maruyama, Koji; and Katsushima, Kenzi, to Yokohama Rubber Co. Ltd., The. Method for treating a polyester synthetic fiber for use as a rubber-reinforcing material. 3,885,067, Cl. 427-381.000.
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Ishigami, Hikoichi; Sato, Akira; Kitayama, Seishi; and Kobayashi, Kouhei, to Kokusai Denshin Denwa Kabushiki Kaisha. Terminal equipment for lincompex telephone system. 3,885,111, Cl. 179-170.800.
Ishii, Akira, to Nippon Telegraph and Telephone Public Corporation. Optical information retrieval apparatus. 3,885,143, Cl. 235-181.000.
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Shimizu, Masaru; Fujiwara, Hiroshi; and Iwai, Shinji, 3,884,992.
Iyengar, Ramachandra K., to Jones & Laughlin Steel Corporation. Fluxes. 3,884,678, Cl. 75-52.000.
J. I. Case Company: *See—*
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Jachimowicz, Ludwik; and Olszewski, Jerzy A., to General Cable Corporation. Pressure fused watertight disc coaxial cable. 3,885,083, Cl. 174-28.000.
Jackson, Albert Edward; and Williams, Ernest Wynne, to British Steel Corporation. Method of providing an aluminum coating on a steel substrate. 3,884,729, Cl. 148-11.50A.
Jackson, John Harry: *See—*
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Jacobs, Louis John, to Combustion Engineering, Inc. Method of coating wire screen cloth. 3,884,727, Cl. 148-6.200.
Jaenke, Hans-Jurgen: *See—*
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Jahn, Walter; and Piesch, Ernst, to Gesellschaft fur Kernforschung mbH; and Jenaer Glaswerk Schott & Gen. Measuring element for the detection and determination of radiation doses of gamma radiation and neutrons. 3,885,159, Cl. 250-472.000.
Jain, Prabhat Kumar: *See—*
Beckman, Paul; Gerding, Benjamin F.; and Jain, Prabhat Kumar, 3,884,085.
James Burn Binelings Limited: *See—*
Adams, Sidney George William; and Galliford, Edgar Horace, 3,883,916.
James, Joseph W. Drawing case for architects and the like. 3,884,351, Cl. 206-225.000.

Janssen, Paul Adriaan Jan; Niemegeers, Carlos Jan Ernest Josef; Stokbroekx, Raymond Antoine; and Vandenberk, Jan, to Janssen Pharmaceutica N.V. 2,2-Diaryl-4-(4-aryl-4-hydroxy-piperidino)-butyramides. 3,884,916, Cl. 260-247.70G.

Janssen Pharmaceutica N.V.: *See—*
Janssen, Paul Adriaan Jan; Niemegeers, Carlos Jan Ernest Josef; Stokbroekx, Raymond Antoine; and Vandenberk, Jan, 3,884,916.
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Jansson, Birger F., to J. I. Case Company. Fluid translating device with improved vane support. 3,884,603, Cl. 418-177.000.

Japan Exlan Company Limited: *See—*
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Jarrett, Kenneth L., Sr.: *See—*
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Jeanmart, Claude: *See—*
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Jeannet, Pierre Maurice; and Girardin, Michel, to Societe Suisse pour l'Industrie Horlogere Management Services, S.A. Chronograph watch. 3,884,035, Cl. 58-39.500.

Jen, Timothy Yu-Wen: *See—*
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Jenaer Glaswerk Schott & Gen.: *See—*
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Jeninga, John, to Atlantic Products Corporation. Golf bag cradle-bracket. 3,884,439, Cl. 248-96.000.

Jenkins, Ronnie C.: *See—*
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Jensen, Garold K., to United States of America, Navy. Storage radar system. 3,885,240, Cl. 343-9.000.

Jensen, Harvey M., to United States of America, Navy. Control system for torpedoes. 3,884,170, Cl. 114-20.00R.

Jeram, Edward M.; and Striker, Richard A., to General Electric Company. High strength organopolysiloxane compositions. 3,884,866, Cl. 260-32.8SB.

Jerard, Robert B.; and Ohlenbusch, Cord W., to Liberty Mutual Insurance Company. Bioelectrically controlled prosthetic member. 3,883,900, Cl. 3-1.100.

Jesensky, Alexander; and Meller, Frederick D., to Addressograph Multigraph Corporation. Film loading assembly. 3,884,567, Cl. 353-23.000.

Jet Aeration Company: *See—*
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Jidosha Kiki Kabushiki Kaisha: *See—*
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Jiffy Products International Ltd.: *See—*
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Jilbert, Phillip Harvey, to National Research Development Corporation. Ionization chamber. 3,884,817, Cl. 250-385.000.

Jiruse, Jaroslav, to Adamovske strojirny, narodni podnik. Air distributing device for a pneumatic sheet-feeding device. 3,884,460, Cl. 271-98.000.

Johansson, Sten Gunnar, to Aktiebolaget Ifoverken. Packaging carton. 3,884,350, Cl. 206-44.120.

John Ott Laboratories: *See—*
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Johns Hopkins University, The: *See—*
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Johnson, Alfred E.: *See—*
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Johnson, Charles S. Method for improving the resonances of stringed instruments. 3,884,109, Cl. 84-275.000.

Johnson, Gordon E.: *See—*
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Johnson, Wayne F.; and Walker, William A., to United States of America, Energy Research and Development Administration. Programmable positive displacement pump. 3,884,126, Cl. 92-13.700.

Johnson, William S.; Morton, Douglas R.; and Gravestock, Michael B., to Leland Stanford Junior University, The Board of Trustees of. Synthesis of steroids by cyclization in nitro solvents. 3,884,945, Cl. 260-397.300.

Johnston, Frederick B.: *See—*
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Jones, Peter Charles. Fluidised bed apparatus. 3,884,182, Cl. 118-308.000.

Jones, Peter Hadley; Martin, Jerry Roy; McAlpine, James Bruce; Pauvlik, Jeanne Marie; and Tadanier, John Soloman, to Abbott Laboratories. 4''-Deoxy-4''-oxoerythromycin B derivatives. 3,884,903, Cl. 260-210.00E.

Jones, Peter Hadley; McAlpine, James Bruce; Pauvlik, Jeanne Marie; and Perun, Thomas John, to Abbott Laboratories. 11-Substituted erythromycin B derivatives. 3,884,904, Cl. 260-210.00E.

Jonsson, Finn Lennart, to AB Carbox. Machine frame, having a biased wire girdle, and a method for biasing such a girdle. 3,884,142, Cl. 100-214.000.

Jordan, Edward J., to Jet Aeration Company. Air vent. 3,884,134, Cl. 98-64.000.

Jordan, Heinz: *See—*
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Junek, Jan: *See—*
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Kahn, Leonard R. Bimode communication system with freeze circuit. 3,885,216, Cl. 325-22.000.

Kaiserswerth, Hans-Peter; Kowalkowski, Klaus; and Benedikter, Siegfried H., to Siemens Aktiengesellschaft. Structure for sealing a joint in an electromagnetic screening enclosure. 3,885,084, Cl. 174-35.0MS.

Kakihama, Sanehiko; and Stoneham, Edward B., to Hewlett-Packard Company. Method for achieving uniform exposure in a photosensitive material on a semiconductor wafer. 3,884,698, Cl. 117-217.000.

Kalberer, Karl H.: *See—*
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Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to Societe Anonyne dite: L'Oreal. Indophenols dyes for coloring keratin fibers. 3,884,625, Cl. 8-10.000.

Kanai, Hiromi: *See—*
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Kanazawa, Toyoji; and Yoshida, Makoto, to Citizen Watch Co., Ltd. Driving circuits for electronic clocks and watches. 3,884,032, Cl. 58-23.00A.

Kanebo, Ltd.: *See—*
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Karrer, Friedrich, to Ciba-Geigy AG. Epoxy containing acylated terpenoid amines. 3,884,941, Cl. 260-348.00A.

Kasahara, Tadashi; Kimura, Yoshiaki; and Kawai, Masanori, to Konishiroku Photo Industry Co., Ltd. Method of eliminating gaps between the exit pupils of superimposed focused-image holograms. 3,884,545, Cl. 350-3.500.

Kasradze, Gaioz Grigorievich: *See—*
Gogorishvili, Platon Vladimirovich; Geleishvili, Tengiz Pavlovich; Zarkua, Nina Porfirievna; Nikolishvili, Georgy Alexeevich; Dundua, Rusudan Georgievna; Svintidze, Nadezhda Georgievna; Onuchkina, Nina Ivanovna; Kasradze, Gaioz Grigorievich; and Kuperman, Genrikh Moiseevich, 3,883,908.

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Katayama, Shinya: *See*—
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Katsushima, Kenzi: *See*—
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Katz, Martin J.; and Gesualdi, William A. Fail-safe electronic encoder for selectively operating railway signal indicator. 3,885,228, Cl. 340-47.000.

Katzschner, Wolfgang: *See*—
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Kaufman, Harry. Hand operated desoldering device. 3,884,409, Cl. 228-20.000.

Kaupert, Gunther. Nestable compartmentalized trays. 3,884,381, Cl. 220-23.600.

Kawabata, Yasuhiro: *See*—
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Kawabe, Ushio; Fukase, Shigeo; Ishibashi, Masato; Kudo, Mitsuhiro; and Takatoku, Kazue, to Hitachi, Ltd. Novel superconducting material. 3,884,683, Cl. 75-174.000.

Kawai, Masanori: *See*—
Kasahara, Tadashi; Kimura, Yoshiaki; and Kawai, Masanori, 3,884,545.

Kawajiri, Kiyoshi: *See*—
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Keenan, George R., to R. E. Corporation. Asphalt spreader. 3,884,395, Cl. 222-176.000.

Kehm, Paul H., to Teleflex Incorporated. Transmission assembly. 3,884,449, Cl. 251-294.000.

Keidel, Frederick Andrew, to du Pont de Nemours, E. I., and Company. Preparation of hydrouquinone. 3,884,776, Cl. 204-73.00R.

Keindl, John, to Lawrence Peska Associates, Inc. Nasal filter. 3,884,223, Cl. 128-140.00N.

Keller, Hans, to Hell, Ing. Rudolf, Dr. Method of producing color correction signals and color separation signals. 3,885,244, Cl. 358-80.000.

Keller, Pierre: *See*—
Brandli, Gerold; and Keller, Pierre, 3,884,075.

Kelly, John L., Jr., to GTE Sylvania Incorporated. Process for cleaning halophosphate furnaces. 3,884,249, Cl. 134-2.000.

Kemp, Woodrow E., to Koppers Company, Inc. Primer for treating metal surfaces. 3,884,851, Cl. 260-3.300.

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Kenney, James T. Structural panel and method of fabrication thereof. 3,884,646, Cl. 29-191.400.

Kerala State Industrial Development Corporation: *See*—
Pullukattu, Joseph Thomas; and Pulimoottil, Mathew Mathew, 3,884,675.

Kerschner, Paul M.: *See*—
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Kerstetter, Donald R., to GTE Sylvania Incorporated. Cathode-grid assembly for a cathode ray tube. 3,885,191, Cl. 313-447.000.

Kessler, Richard B., to Lea-Ronal, Inc. Electrolytic deposition of zinc. 3,884,774, Cl. 204-55.00Y.

Kesting, Robert Emil, to United States of America, Interior. Preparation of reverse osmosis membranes by complete evaporation of the solvent system. 3,884,801, Cl. 210-23.000.

Kidd, Earl H.: *See*—
Dahl, Einar S.; and Kidd, Earl H., 3,884,020.

Kieburtz, Robert Bruce, to Bell Telephone Laboratories, Incorporated. Modular pipeline multiplier to generate a rounded product. 3,885,141, Cl. 235-164.000.

Kiff, Ben W., to Union Carbide Corporation. Vapor phase hydrogenolysis dehydrogenation process. 3,884,981, Cl. 260-595.000.

Kightlinger, Adrian P.; Crosby, Edward K., deceased (by Crosby, Lovice Vivian, executrix); and Speakman, Edwin L., to Standard Brands Incorporated. Gelatinizable crosslinked cationic starch and method for its manufacture. 3,884,909, Cl. 260-233.30R.

Kightlinger, Neal B.; and Woodall, Rufus W., to Gainesville Manufacturing Co., Inc. Locking apparel clamp. 3,883,933, Cl. 24-250.00R.

Kikuchi, Tom T., to General Motors Corporation. Method and apparatus for magnetically modulated resonance analysis of gas. 3,884,583, Cl. 356-201.000.

Kikuchi, Yoshiyasu: *See*—
Negita, Michihiko; and Kikuchi, Yoshiyasu, 3,885,229.

Kim, Yung Ki; and Pierce, Ogden R., to Dow Corning Corporation. Fluorocarbon triazine compounds. 3,884,875, Cl. 260-46.50E.

Kimura, Isao; and Koyama, Hiroaki, to Kanebo, Ltd.; and Nippon Kynol Inc. Hollow filaments and process for producing same. 3,884,754, Cl. 161-178.000.

Kimura, Yoshiaki: *See*—
Kasahara, Tadashi; Kimura, Yoshiaki; and Kawai, Masanori, 3,884,545.

King, Earl H., to Sund-Borg Machines Corporation. Injection molding machine with shot size regulation. 3,884,608, Cl. 425-145.000.

King, Kenneth Francis, to du Pont de Nemours, E. I., and Company. Adhesive composition and method of making same. 3,884,862, Cl. 260-29.300.

King, Michael L., to Norton, Paul D., a part interest. Device for distributing irrigation water. 3,884,416, Cl. 239-97.000.

King, Robin Charles Moorehouse: *See*—
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Kinne, Walter E., to Stauffer Chemical Company. Production of anhydrous sodium metasilicate in a fluidized bed. 3,884,645, Cl. 23-313.000.

Kinzel, Augustus B. Electrically powered cycle. 3,884,317, Cl. 180-34.000.

Kirchweger, Karl: *See*—
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Kirish, Warand R.: *See*—
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Kirkhof Manufacturing Corporation: *See*—
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Kirkpatrick, George M. Phased array sequential switching between short and long distance targets. 3,885,237, Cl. 343-5.00W.

Kirsch, Maurice: *See*—
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Kita, Takehiko: *See*—
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Kitayama, Seishi: *See*—
Ishigami, Hikoichi; Sato, Akira; Kitayama, Seishi; and Kobayashi, Kouhei, 3,885,111.

Klahr, Carl N. Signal processing apparatus for imaging scanner. 3,885,224, Cl. 340-5.0MP.

Klar, Erhard: *See*—
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Klauk, Bernhard: *See*—
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Klauke, Erich: *See*—
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Klee, John Michael: *See*—
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Klein, Albert M.; and Fujita, Masaaki, to International Telephone and Telegraph Corporation. Phase locked loop receiving system with improved signal acquisition. 3,885,238, Cl. 343-7.00A.

Kleiner, Edward Karl; and Knell, Martin, to Ciba-Geigy Corporation. Perfluoroalkyl-thioether alcohols, esters and polymers thereof. 3,884,879, Cl. 260-609.00R.

Kleinewefers Industrie-Companie GmbH: *See*—
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Klemm, Waldemar A.: *See*—
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Kliment, Karel: *See*—
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Kline, John P. Boat hull with a bottom of a portion of the surface of a hyperboloid. 3,884,171, Cl. 114-62.000.

Knabe, Uwe: *See*—
Rademacher, Friedrich; Quest, Karl; Knabe, Uwe; Unger, Dieter; Jordan, Heinz; Heckmann, Werner; and Plock, Karl, 3,884,277.

Knabenbauer, Wolfgang: *See*—
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Knapp, Donald P.: *See*—
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Knapp, Frank. Animal-operated sprayer. 3,884,192, Cl. 119-159.000.

Knappe, Heinrich; Nolte, Karl-Heinz; and Kempelmann, Reinhold, to Herbert Kannegiesser Kommanditgesellschaft. Apparatus for folding shirts or similar articles of clothing for packing. 3,884,402, Cl. 223-37.000.

Knell, Martin: *See*—
Kleiner, Edward Karl; and Knell, Martin, 3,884,879.

Knight, Houston W., to FMC Corporation. Cylinder-operated valve. 3,884,251, Cl. 137-615.000.

Knoblauch, Willi; and Baranowski, Hans-Peter. Steam sterilizing apparatus. 3,884,636, Cl. 21-94.000.

Kobayashi, Kazuaki; Okuno, Tatsujiro; Katayama, Shinya; and Kita, Takehiko, to Nissan Motor Company Limited. Intake system for an internal combustion engine. 3,885,003, Cl. 261-23.00A.

Kobayashi, Kazuhiko; Takawashi, Tamio; and Arai, Shinji, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for electrolytically etching. 3,884,790, Cl. 204-224.00M.

Kobayashi, Kouhei: *See*—
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Kobayashi, Teruaki: *See*—
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Kober, Ehrenfried H.; Martin, Richard H.; and Raymond, Maurice A., to Olin Corporation. Vapor phase process for preparing halogenated isocyanates. 3,884,952, Cl. 260-453.0PC.

Koch-Light Laboratories Limited: *See*—
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Koch, Paolo; and Perrotti, Emilio, to Snamprogetti S.p.A. Process for the preparation of pyrosulphates. 3,885,024, Cl. 423-512.000.

Koch, Richard C.; and Richards, Hugh C., to Pfizer Inc. Phenylcarbamates. 3,884,962, Cl. 260-479.00C.

Kochs Adler AG: *See*—
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Koda, Yoshinobu; Sasaki, Shosaku; and Koda, Yoshiyuki, to Toray Silicone Company, Ltd. Organopolysiloxane composition having improved heat stability. 3,884,950, Cl. 260-448.20S.

Koda, Yoshiyuki: *See*—
Koda, Yoshinobu; Sasaki, Shosaku; and Koda, Yoshiyuki, 3,884,950.

Kodaira, Kazuo: *See*—
Nagase, Shunji; Baba, Hajime; Kodaira, Kazuo; and Okazaki, Kooshi, 3,884,775.

Kodaira, Yasuo. Switch with an indicator. 3,885,116, Cl. 200-308.000.

Kodys, Edmund, to Foster Grant Co., Inc. Lens holding groove means. 3,884,561, Cl. 351-83.000.

Koenig, Horst; Thieme, Peter; and Amann, August, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Mesoionic 2,3-substituted 5-acylimino-1,3,4-thiadiazoles. 3,884,930, Cl. 260-306.80D.

Koerner, Ernest C.: *See*—
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Kogure, Tsuneo, to Amada Company, Ltd. Reducing valve. 3,884,254, Cl. 137-102.000.

Koike, Yujiro; Maeda, Haruo; Nishino, Tsutomu; Aoyama, Akimitu; and Mogi, Yuji, to Matsushita Electric Industrial Company Limited. Target assembly for storage tubes and a method of making the same. 3,885,188, Cl. 313-394.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Ishigami, Hikoichi; Sato, Akira; Kitayama, Seishi; and Kobayashi, Kouhei, 3,885,111.

Kolb, Gunter, to Bayer Aktiengesellschaft. Chlorinated polypentenamer. 3,884,893, Cl. 260-93.100.

Kolb, Robert E., to Minnesota Mining and Manufacturing Company. Fluoroelastomer compositions with triorganophosphorus oxide. 3,884,877, Cl. 260-47.0UA.

Koleske, Joseph V.: *See*—
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Kollar, John, to Halcon International, Inc. Vicinal glycol ester purification process. 3,884,965, Cl. 260-499.000.

Koller, Rudolf, to Siemens Aktiengesellschaft. Device for adjustment and line-by-line movement of a type body in a type printing device. 3,884,338, Cl. 197-49.000.

Komatsu, Noboru; Arai, Tohru; Sugimoto, Yoshihiko; and Mizutani, Masayoshi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method for forming a carbide layer of a IV-b group element of the periodic table on the surface of a cemented carbide article. 3,885,059, Cl. 427-12.000.

Komatsu, Noboru; Arai, Tohru; Sugimoto, Yoshihiko; and Mizutani, Masayoshi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method for forming a chromium carbide layer on the surface of an iron, ferrous alloy or cemented carbide article. 3,885,064, Cl. 427-228.000.

Komorowski, Klaus; and Kurtz, Peter, to Bayer Aktiengesellschaft. Process for the manufacture of 2,4-dicyano-3,5-dimethylaniline. 3,884,956, Cl. 260-465.00E.

Kondo, Shigeji. Directional-control valve. 3,884,266, Cl. 137-625.270.

Konishiroku Photo Industry Co., Ltd.: *See*—
Kasahara, Tadashi; Kimura, Yoshiaki; and Kawai, Masanori, 3,884,545.

Konsult AB Gerontologia: *See*—
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Kopp, Erich. Method and apparatus for polymerizing molded dental pieces. 3,884,622, Cl. 432-24.000.

Koppen & Lethem Trading Co. A.G.: *See*—
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Koppers Company, Inc.: *See*—
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Kops, Lucian, to Dominion Engineering Works Limited. Trunnion bearing support system. 3,884,420, Cl. 241-176.000.

Korbar, Zdenek: *See*—
Ripka, Josef; Junek, Jan; Vobornik, Vaclav; Lihtarova, Ludmila; Hortlik, Frantisek; Brynda, Vaclav; Ohlidal, Vladimir; Korbar, Zdenek; and Vecera, Milos, 3,884,029.

Kornis, Gabriel; Steinhards, Arnolds; Nidy, Eldon George; and Vostral, Henry J., to Upjohn Company, The. Aminoalkyl esters of di- and trihalopyrazole-1-alkanoic and -1-alkenoic acids. 3,884,934, Cl. 260-310.00R.

Korte, Friedrich W. A. G. K.: *See*—
Rochling, Hans F. W.; Buchel, Karl-Heinz; and Korte, Friedrich W. A. G. K., 3,884,933.

Kosaka, Yujiro; Uemura, Masaru; Saito, Mitsutaka; Suzuki, Yuji; and Takamoto, Kunio, to Toyo Soda Manufacturing Co., Ltd. Graft-polymer of vinyl chloride and producing process thereof. 3,884,991, Cl. 260-878.00R.

Koshimo, Akio; Tomita, Kosuke; Takagi, Kunihiko; Mitsui, Minoru; and Isikawa, Kunihiro, to Unitika, Ltd. Photosensitive polyamide composition. 3,884,702, Cl. 96-115.00P.

Kostevich, Dmitry Nikolaevich: *See*—
Dudko, Daniil Andreevich; Alexeenko, Alexei Pavlovich; Lychko, Ivan Ivanovich; Iljushenko, Valentin Mikhailovich; Suschuk-Sljusarenko, Igor Ivanovich; Tarnovsky, Alexandr Grigorievich; Kostevich, Dmitry Nikolaevich; Andrusenko, Jury Iosifovich; Gurevich, Samuil Markovich; and Strakhov, Gennady Nikolaevich, 3,885,121.

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Koyama, Hiroaki: *See*—
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Kozinczuk, Orest, to Innovative Process Equipment, Inc. Electrolytic steam generator. 3,885,124, Cl. 219-288.000.

Kraffczyk, Friedrich; and Helger, Roland, to Merck Patent Gesellschaft mit beschraenkter Haftung. Reaction chamber unit for test strips. 3,884,641, Cl. 23-253.00R.

Krasnov, Mikhail M. Method of glaucoma treatment. 3,884,236, Cl. 128-303.100.

Krautwurst, Homer V.; and Schulitz, Cristian F., to General Motors Corporation. Tank fill vapor control. 3,884,204, Cl. 123-136.000.

Kristiansen, Odd, to Ciba-Geigy Corporation. S-diphenylmethyl-dithiophosphates. 3,884,998, Cl. 260-948.000.

Kruger, Gunter; Baum, Helmut; and Widmaier, Manfred, to Robert Bosch G.m.b.H. Method of making a thin film electronic circuit unit. 3,883,947, Cl. 29-578.000.

Kruka, Vitold R., to Shell Oil Company. Friction reduction. 3,884,252, Cl. 137-13.000.

Krupa, Vernon: *See*—
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Kudo, Mitsuhiro: *See*—
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Kuehn, Andrew, III, to Systematics, Inc. Magneto-generator ignition system. 3,884,207, Cl. 123-148.00R.

Kuehnle, Manfred R., to Coulter Information Systems, Inc. Sputtering method for thin film deposition on a substrate. 3,884,787, Cl. 204-192.000.

Kuhl, Dieter; and Marchetto, Manfredo, to Siemens Aktiengesellschaft. Composition for catalytic decomposition of hydrogen. 3,884,836, Cl. 252-455.00R.

Kuligowski, Gerd, to Siemens Aktiengesellschaft. Moving coil system for light-beam galvanometers, light-beam oscillographs and the like. 3,885,214, Cl. 324-154.00R.

Kulka, Kurt; and Zazula, Teodosij, to Fritzsche Dodge & Olcott Inc. Alkyl monomethyl-ringsubstituted-diacetoxy-benzoate perfume compositions. 3,884,843, Cl. 252-522.000.

Kumada, Masayuki: *See*—
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Kunak, Anthony F.; and Falatok, Andrew, to Atteny, Inc. Process for producing decorative pile fabrics. 3,884,743, Cl. 156-304.000.

Kunig, Horst. Detection of absence of concentration and coherence in a subject. 3,883,962, Cl. 35-22.00R.

Kunii, Takehiko. Refuse loader. 3,884,372, Cl. 214-83.300.

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Kuno, Mitsuzo: *See*—
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Kunz, Walter George, Jr., to du Pont de Nemours, E. I., and Company. Device for gas-exit ducts to convert vortical gas flow to sound-attenuated axial gas flow. 3,884,323, Cl. 181-41.000.

Kunze, Ernst-Gunter: *See*—
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Kurtz, Arthur L. Inside pipecutter. 3,883,950, Cl. 30-106.000.

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Kuzyk, Roman. Method for motor control. 3,885,170, Cl. 307-252.0UA.

Kyburz, Emilio; and Spiegelberg, Hans, to Hoffmann-LaRoche Inc. Tricyclic amines and processes for the preparation thereof. 3,884,967, Cl. 260-501.100.

L. & C. Steinmuller GmbH: *See—*
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Laing, Nikolaus; and Laing, Ingeborg. Electric storage air heater. 3,884,295, Cl. 165-96.000.
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Land, Joseph G., Jr.: *See—*
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Landecker, Kurt. Thermoelectric element. 3,884,726, Cl. 136-203.000.
Landen, William James, to Eyelet Specialty Co., Incorporated. Bottle safety closure. 3,884,379, Cl. 215-221.000.
Landolt, Joseph G. Means for windrow maintenance. 3,884,022, Cl. 56-364.000.
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Laurance, Dale Roderic; Roe, Richard Dale; and Sheppard, Robert Gene, to du Pont de Nemours, E. I., and Company. Regenerated cellulose recovery process using a humid gas to remove coating solvent. 3,884,907, Cl. 260-212.000.
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Lederman, Jack M., to Goodyear Tire & Rubber Company, The. Floatable rubberized fabric. 3,885,077, Cl. 428-265.000.
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Leiter, Larry L.; Wright, Gerard C.; and Bowman, David G., to Xerox Corporation. Apparatus for ejecting a stapled set of sheets sidewise from the collating bins. 3,884,408, Cl. 227-100.000.
Leko, Toma D. Spring in the form of stacked sheet metal plates. 3,884,457, Cl. 267-162.000.
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Lemelson, Jerome H. Display sheet material and method. 3,884,554, Cl. 350-164.000.
Leng, John Lindley; and Newton, David Frederick, to Imperial Chemical Industries Limited. Water soluble quaternized benzthiazole phenylazopyridine dyestuffs. 3,884,899, Cl. 260-146.00R.
Leonard, Verna M. Musical cycle differentiation aid. 3,884,110, Cl. 84-471.000.
Leonard, Verna M. Inversion maker and chord matcher. 3,884,111, Cl. 84-471.000.
Leonard, Verna M. Key signature structure teaching aid. 3,884,112, Cl. 84-471.000.
Leonard, Verna M. Slide rule chord indicator. 3,884,113, Cl. 84-471.000.
Leonard, Verna M. Major and minor chord organizor. 3,884,114, Cl. 84-471.000.
Leonard, Verna M. Interval teaching aid. 3,884,115, Cl. 84-471.000.
Lepetit, Marcel; Charles, Christian; Nonnet, Jean; and LeFoll, Francois, to Le Nickel; and Centre National pour l'Exploitation des Oceans. Casting-off device. 3,884,518, Cl. 294-83.00R.
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Lew, Hyok Sang. Self-attaching coupling spring for the coupled chopsticks. 3,884,456, Cl. 267-156.000.
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Liggett, James J. Method for preparing simulated meat, fish and dairy products. 3,885,048, Cl. 426-18.000.
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Limburg, William W., to Xerox Corporation. Polycyclic aromatic polymer as a photoconductor or overlayer. 3,884,689, Cl. 96-1.500.

Limouze, Charles A., to United States of America, Navy. Guidance and control systems demonstrator for a guided missile. 3,883,961, Cl. 35-10.400.

Lind, Per Ingemar Arnold, to Svenska Utvecklings AB (SUAB), Swedish National Development Co. Transducer for a flow gauge. 3,884,069, Cl. 73-194.00C.

Lindblad, Nero R.; Johnson, Gordon E.; and Sharp, James H., to Xerox Corporation. Imaging composition. 3,884,825, Cl. 352-62.100.

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List, Hans; Affenzeller, Josef; and Kirchweger, Karl, to Hans List. Inlet port for internal combustion engines. 3,884,209, Cl. 123-188.00M.

Little, David C., to GAF Corporation. Algicidal roofing granules. 3,884,706, Cl. 106-15.00R.

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Lodige, Wilhelm; Lodige, Fritz; and Lucke, Josef. Liquid cooled mixing tool for machines for applying glue to shavings. 3,884,294, Cl. 165-92.000.

Logie, Charles F., to American Store Equipment Corporation. Partition system. 3,884,002, Cl. 52-285.000.

Logsdon, Duane D. Plumbing structure. 3,884,438, Cl. 248-59.000.

Logsdon, Duane D. Scupper drain structure. 3,884,809, Cl. 210-163.000.

Lohr, Alfred; Tschek, Wolfgang; Forster, Heinz; Klauk, Bernhard; and Schwan, Wolfgang, to F. Kuppersbusch & Sohne Aktiengesellschaft. Cooking appliance. 3,884,135, Cl. 99-348.000.

Loliger, Willi; and Schmied, Rudolf, to Alpura Koreco A.G. Welding apparatus for a packaging machine. 3,884,746, Cl. 156-466.000.

Lorenz, Walter; Jautelat, Manfred; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. O,O-dialkyl-1-cyanoalkyl-ketonoxime-thionophosphoric acid esters. 3,884,996, Cl. 260-940.000.

Lowell, Seymour. Surface area determination by direct read-out. 3,884,083, Cl. 73-432.0PS.

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Luoma, Richard William, to International Business Machines Corporation. Document card reader. 3,885,132, Cl. 235-61.11R.

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Maciolek, Ralph B.; Skogman, Richard A.; and Speerschneider, Charles J., to Honeywell, Inc. Substrate preparation for liquid phase epitaxy of mercury cadmium telluride. 3,884,788, Cl. 204-192.000.

Madlener, Paul; and Pecksen, Otto, to Industrie-Werke Karlsruhe Augsburg Akt. Detonator for land mines. 3,884,151, Cl. 102-19.200.

Maeda, Haruo: *See—*
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Maeda, Hiroaki: *See—*
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Maender, Otto William: *See—*
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Maessen, Jan Th. M. F.; and DeRijke, David, to Naarden International, N.V. 2-n-Butyl 4,4,6-trimethyl-1,3 dioxane perfume. 3,884,841, Cl. 252-522.000.

Magee, Philip S., to Chevron Research Company. Insecticidal N-aralkanoyl and N-aralkenoyl derivatives of O,S-dihydrocarbylphosphoroamidothioates and S,S-dihydrocarbylphosphoroamidodithioates. 3,885,032, Cl. 424-212.000.

Magill, John W. Telescopic connection for the proximate end of an airport passenger bridge. 3,883,918, Cl. 14-71.000.

Magnavox Company, The: *See—*
Lee, Lawrence L., 3,885,173.

Mahoney, John A.; and Hensley, Albert L., Jr., to Standard Oil Company. Reforming with platinum-rhenium-selenium catalysts. 3,884,799, Cl. 208-139.000.

Maillard, Jacques Georges, to Laboratoires Jacques Logeais. Therapeutic composition containing 1-(2-hydroxy-2-indanyl)-propylamine. 3,885,045, Cl. 424-330.000.

Makarov, Ivan Grigorievich: *See—*
Budker, Gersh Itskovich; Karliner, Marlen Moiseevich; Makarov, Ivan Grigorievich; Morozov, Sergei Nikolaevich; Nezhevenko, Oleg Alexandrovich; Ostreiko, Gennady Nikolaevich; and Shekhtman, Isai Abramovich, 3,885,193.

Makino, Junichi: *See—*
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Malatesta, Roger J. Pneumatic collapsible exercising device of the according type. 3,884,463, Cl. 272-79.00C.

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Malzac, Guillaume: *See—*
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Mancuso, Arion: *See—*
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Manecke, Siegfried E., to Robertshaw Controls Company. Thermostat construction. 3,885,222, Cl. 337-338.000.

Mann, Abe: *See—*
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Mansei Kogyo Kabushiki Kaishya: *See—*
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Markham, Harry: *See*—
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Maroshick, Max, to Boeing Company, The. Articulate railway vehicle stabilizing linkage apparatus. 3,884,155, Cl. 105-4.00R.
Marschak, Howard J. Shelving and/or display unit. 3,884,358, Cl. 211-148.000.
Marsee, Frederick J., to Ethyl Corporation. High velocity carburetor. 3,885,004, Cl. 261-23.00A.
Marsh, Richard O., Jr. Pipe coupling devices. 3,884,509, Cl. 285-37.000.
Martel, Jacques; and Costerousse, Germain, to Rousell Uclaf. Process for the preparation of vincamine. 3,884,927, Cl. 260-293.530.
Marten, Fritz, to Siemens Aktiengesellschaft. Propulsion arrangement equipped with a linear motor. 3,884,154, Cl. 104-148.0MS.
Martensson, Kjell H.: *See*—
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Jones, Peter Hadley; Martin, Jerry Roy; McAlpine, James Bruce; Pauvlik, Jeanne Marie; and Tadanier, John Soloman, 3,884,903.
Martin, Peter G., to Arthur D. Little, Inc. Tape cassette. 3,884,430, Cl. 242-199.000.
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Mason, Cecil George Willmot. End cap for the fluid impregnation of timber. 3,884,634, Cl. 21-72.000.
Massachusetts Institute of Technology: *See*—
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Massengill, Roy H.; and Buff, Ernest D., to Allied Chemical Corporation. Inflation differential control for multiple bag restraint system. 3,884,497, Cl. 280-150.0AB.
Massie, Kenneth Herbert; and Chalton, Gordon Alfred, to Chalton Electronic Services Limited. Mastitis detector. 3,884,187, Cl. 119-14.140.
Massie, Philip E. Variable displacement sealed pump. 3,884,125, Cl. 92-13.500.
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Matern, Jean-Jacques. Attachment for Varying Spray from Pressurized Containers. 3,884,399, Cl. 222-402.130.
Matsuda, Hideaki; Yamauchi, Fujio; and Mori, Hisakazu, to Okura Kogyo Kabushiki Kaisha. Process for preparation of nonflammable water-containing polymer material from basic salts of polymerizable mixtures of ethylenically unsaturated phosphates. 3,884,864, Cl. 260-29.7NR.
Matsui, Katsuaki: *See*—
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Matsuo, Kazunori; Suzuki, Kohji; and Endo, Katutsohi, to Ricoh Co., Ltd. Method and composition of mixed $BaSO_4$ and $SrSO_4$ for polishing a photoconductor surface. 3,884,824, Cl. 252-164.000.
Matsushita Electric Industrial Company Limited: *See*—
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Matsushita, Kunichi; Sakurada, Hikaru; and Onuma, Kazuhiko, to Mitsubishi Chemical Industries, Ltd. Catalytic reducing decomposition of oxides of nitrogen. 3,885,019, Cl. 423-213.200.
Matsuzaki, Atsushi, to Sony Corporation. Peak detector. 3,885,168, Cl. 307-235.00A.
Mattel, Inc.: *See*—
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Maudlin, Wendell E., to Borg-Warner Corporation. Refrigerant charging method and apparatus. 3,884,047, Cl. 62-77.000.
Maurer, Donald J.; and Sims, Dermot F., to Mattel, Inc. Pneumatic projector and pneumatically responsive targets. 3,884,471, Cl. 273-101.200.
Maurer, Donald L. Lock protection apparatus. 3,884,057, Cl. 70-259.000.
Maurer, Robert D.; and Schultz, Peter C., to Corning Glass Works. Germania containing optical waveguide. 3,884,550, Cl. 350-96.0WG.
Mauthner, Thomas, to Cambridge Chemical Products, Inc. Method for counting blood platelets. 3,884,579, Cl. 356-39.000.
Mauvernay, Roland-Yves; Bush, Norbert; Moleyre, Jacques; Monteil, Andre; and Simond, Jacques. 1-[3-(1-Ethynlcyclohexyloxy)-2-hydroxy]-propyl-[4-phenyl, or 4-(2-phenyl-2-alkoxy)-]ethyl-piperzines. 3,884,923, Cl. 260-268.0PH.
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Jones, Peter Hadley; McAlpine, James Bruce; Pauvlik, Jeanne Marie; and Perun, Thomas John, 3,884,904.
McBerty, Ford H. Coating apparatus. 3,884,180, Cl. 118-122.000.
McCachren, Gary S., to General Electric Company. Appliance cord anchor. 3,884,543, Cl. 339-105.000.
McCarter, Arol B.; and Van Os, Seymour, Jr., to Blount, R. E., a part interest. Well pump for fluids and vapors. 3,884,299, Cl. 166-68.000.
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McCartney, Joseph F., to United States of America, Navy. Electrochemical energy source for diver suit heating. 3,884,216, Cl. 126-204.000.
McClary, Joseph Michael, to Kusan, Inc. Kazoo and Face Mask Combination. 3,883,982, Cl. 46-1.00F.
McCloskey, Albert R., to Rockwell International Corporation. Ball bearing assembly. 3,884,537, Cl. 308-6.00C.
McClure, Daniel J.: *See*—
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McCubbin, John Gordon, to Alcan Research and Development Limited. Method of direct chill continuous casting. 3,884,290, Cl. 164-82.000.
McCullough, John E.: *See*—
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Olsen, Larry C.; and Scott, Howard W., 3,885,007.
McFadden, Edward Joseph, to Byron Jackson Inc. Safety latch for well pipe elevators. 3,884,519, Cl. 294-90.000.
McGilvery, James D., to Erco Industries Limited. Bipolar electrodes. 3,884,792, Cl. 204-290.00F.
McGovern, Terrence P.; Beroza, Morton; and Fiori, Bart J., to United States of America, Agriculture. Esters of 1,4-benzodioxan-2-carboxylic acid as attractants for the european chafer. 3,884,937, Cl. 260-340.300.
McGraw-Edison Company: *See*—
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McKee, Raymond J. Twin lock key tag. 3,884,059, Cl. 70-456.00R.
McLaughlin, James Hugh, to Center For New Product Development. Actuation overcap for aerosol can. 3,884,398, Cl. 222-402.130.
McLeod, Gordon D.: *See*—
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McMaster, Samuel B., to Do-It Corporation. Peel-resistant pressure-sensitive hangers. 3,884,443, Cl. 248-467.000.
McNair, Robert Bruce; and Gallagher, Raymond J. Fire alarm box. 3,885,236, Cl. 340-304.000.
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Medical Monitor Systems, Inc.: *See—*
Richardson, Philip C.; Hudspeth, Emmett L.; Boger, Allen D., Jr.; and Dykstra, Jerald P., 3,884,219.

Mehnert, Johannes S. Blow-molding apparatus. 3,884,610, Cl. 425-387.00B.

Mehta, Nariman B., to Burroughs Wellcome Co. Meta chloro or fluoro substituted alpha-T-butylaminopropionphenones in the treatment of depression. 3,885,046, Cl. 424-330.000.

Meiller, Hermann; and Hocke, Horst, to Grammer, Willibad. Push button fastening device for safety belt portions. 3,883,932, Cl. 24-230.00A.

Meller, Frederick D.: *See—*
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Melton, Kenneth W., to Seymour Foods, Inc. Carton cover closing machine. 3,884,015, Cl. 53-131.000.

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Menasha Corporation: *See—*
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Menown, Hugh; and Jones, Eric, to English Electric Valve Company Limited. Thyratrons. 3,885,183, Cl. 313-195.000.

Mentken, Robert. Picture frame strip. 3,883,975, Cl. 40-155.000.

Merciadis, Gregory C., to Shell Oil Company. Vacuum distillation sampling apparatus. 3,884,082, Cl. 73-422.0TC.

Mercier, Bernard; and Serrano, Francisco, to Subsea Equipment Associates Limited (SEAL). Apparatus for connecting underwater installations. 3,884,364, Cl. 214-1.00R.

Mercier, Loic: *See—*
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Merck Patent Gesellschaft mit beschraenkter Haftung: *See—*
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Merk, Paul Joseph, to Canadian Marconi Company. System for improving the reliability of indicator arrangements. 3,885,230, Cl. 340-166.0EL.

Merker, Reuven; and Lucca, Salvatore, to Metalux Corporation, The. Electrodeposition of nickel. 3,884,773, Cl. 204-49.000.

Merkle, Ralph H., to General Motors Corporation. Dual tank fuel system. 3,884,255, Cl. 137-265.000.

Merklin, Kenneth E.: *See—*
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Merz, Herbert: *See—*
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Mesinger, Robert H. Bicycle seat structure. 3,884,525, Cl. 297-212.000.

Messenger, Joseph U., to Mobil Oil Corporation. Well cementing process. 3,884,302, Cl. 166-291.000.

Messenschmitt-Bolkow-Blohm GmbH: *See—*
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Messer, Mayer Naoum: *See—*
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Metafab Industries, Inc.: *See—*
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Metal Box Company Limited, The: *See—*
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Metalux Corporation, The: *See—*
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Meyer, Burton C., to Marvin Glass Associates. Game apparatus. 3,884,472, Cl. 273-121.00R.

Michaelis, Jack H.; and Malcik, Frank J., to Swingline, Inc. Safety lock loose-leaf ring binder mechanism. 3,884,586, Cl. 402-38.000.

Midwest Chrome Process Company: *See—*
Hage, Jacob M., 3,884,116.

Mikitenko, Paul; Cohen, Georges; and Asselineau, Lionel, to Institut Francais du Petrole, des Carburants et Lubrifiants. Process for purifying benzene and toluene by extractive azeotropic distillation. 3,884,769, Cl. 203-53.000.

Mikule, Jiri: *See—*
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Milicevic, Branimir: *See—*
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Millar, James S.; and Henderson, Glenn W., to Parker-Hannifin Corporation. Coupler. 3,884,448, Cl. 251-149.900.

Miller, Charles J.: *See—*
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Miller, Donald E., to Continental Can Company, Inc. Sonic transducer. 3,885,172, Cl. 310-8.700.

Miller, Donald W.: *See—*
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Miller, Edward F.; and Hellmuth, Walter W., to Texaco Inc. Polybutenyl-alkylene polyamine-polyalkanol lubricant additive and lubricating compositions containing same. 3,884,821, Cl. 252-51.50R.

Miller, Edward J. Fire control system for multi-zone buildings. 3,884,133, Cl. 98-33.00R.

Miller, Glenn E.: *See—*
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Miller, Herman C. Concrete insert. 3,884,008, Cl. 52-699.000.

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Miller, James E.; and Swenson, Reuben A., to Standard Oil Company. Grease composition. 3,884,820, Cl. 252-41.000.

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Milsner, Leon S. Weight for bowling balls. 3,884,465, Cl. 273-54.00B.

Minagawa, Nobuhiko, to Fuji Photo Film Co., Ltd. Photographic support. 3,884,692, Cl. 96-85.000.

Minaka, Eiji: *See—*
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Minnick, Robert C.; Bailey, Paul T.; Sandfort, Robert M.; and Semon, Warren L., to Monsanto Company. Bubble detection systems and multipliers used therein. 3,885,233, Cl. 340-174.0ZA.

Minolta Camera Kabushiki Kaisha: *See—*
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Minowa, Isamu: *See—*
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Misselhorn, Klaus. Process for obtaining purified alcohol from fermented mash. 3,884,770, Cl. 203-82.000.

Mitsubishi Chemical Industries, Ltd.: *See—*
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Mitsubishi Rayon Co., Ltd.: *See—*
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Mitsui, Minoru: *See—*
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Mitsui Shipbuilding & Engineering Co., Ltd.: *See—*
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Mitteldorf, Rudolf; Pfluger, Erich; and Steinicke, Werner, to Suddeutsche Kalkstickstoff-Werke Aktiengesellschaft. Method of preparing a stable mixture of calcium with a compound yielding water at elevated temperature. 3,884,679, Cl. 75-53.000.

Miyajima, Masayoshi: *See—*
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Miyaki, Kiyoshi; Okubo, Akira; and Arai, Sakuji, to Honda Giken Kogyo Kabushiki Kaisha. Internal combustion engine. 3,884,197, Cl. 123-75.00B.

Miyanohara, Isao: *See—*
Otsuki, Susumu; Miyanohara, Isao; Mizui, Norimasa; and Kawamura, Hideo, 3,884,846.

Miyao, Kunioki: *See—*
Hanabusa, Takayoshi; Isozuka, Hiroshi; Miyao, Kunioki; and Gaku, Morio, 3,884,771.

Miyao, Takayuki; Maeda, Hiroaki; and Sato, Masanori, to Aisin Seiki Kabushiki Kaisha. Damper mechanism for hydrostatic transmission. 3,884,095, Cl. 74-687.000.

Miyazawa, Yoshihide: *See—*
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Mizuno, Hironaga: *See—*
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Komatsu, Noboru; Arai, Tohru; Sugimoto, Yoshihiko; and Mizutani, Masayoshi, 3,885,064.

Moberly, Charles W., to Phillips Petroleum Company. Arylene sulfide polymers. 3,884,883, Cl. 260-79.100.

Mobil Oil Corporation: *See—*
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Gemmill, Robert M., Jr., 3,884,822.
Goldstein, Theodore P., 3,884,971.
Messenger, Joseph U., 3,884,302.

Mochimaru, Hideaki; Suzuki, Shigeru; Ikezu, Yohei; Yaeshima, Masao; and Ukai, Takeshi, to Ricoh Co., Ltd. Exposure unit for a copying machine having a variable magnification. 3,884,576, Cl. 355-69.000.

Mogi, Yuji: *See—*
Koike, Yujiro; Maeda, Haruo; Nishino, Tsutomu; Aoyama, Akimitu; and Mogi, Yuji, 3,885,188.

Mohnach, Michael G.: *See—*
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Moissl, Friedrich-Gerhard, to Siemens Aktiengesellschaft. Street traffic signalling system. 3,885,227, Cl. 340-41.00R.

Molbert, Robert A., to General Tire & Rubber Company, The. Flame retardant flexible urethane foams. 3,884,849, Cl. 260-2.5BB.

Moleyre, Jacques: *See—*
Mauvernay, Roland-Yves; Bush, Norbert; Moleyre, Jacques; Monteil, Andre; and Simond, Jacques, 3,884,923.

Molnar, Nicholas M. Antibacterial quaternary ammonium salts and method of preparing the same. 3,884,977, Cl. 260-567.60P.

Monahan, Thomas J., to G. T. Schjeldahl Company. Intermittent web drive mechanism employing unidirectional clutches. 3,884,129, Cl. 97-8.00R.

Monarch Marking Systems, Inc.: *See—*
Mulholland, Robert P., 3,884,342.

Monastyrsky, Viktor Nikolaevich: *See—*
Samoilov, Sergei Mikhailovich; Monastyrsky, Viktor Nikolaevich; Pudovik, Svetlana Tikhonovna; and Kuznetsov, Evgeny Vasilievich, 3,884,891.

Monroe Industries, Inc.: *See—*
Monroe, Robert A., 3,884,218.

Monroe, Robert A., to Monroe Industries, Inc. Method of inducing and maintaining various stages of sleep in the human being. 3,884,218, Cl. 128-1.00C.

Monsanto Chemicals Limited: *See—*
Baxter, Samuel; and Gilbert, John Harold, 3,884,030.

Monsanto Company: *See—*
Bir, Wallace G.; and Novack, Joseph, 3,884,766.
Fariss, Robert H.; and Snelgrove, James A., 3,884,865.
Graves, Donald Burrell; and Maender, Otto William, 3,885,001.
Minnick, Robert C.; Bailey, Paul T.; Sandfort, Robert M.; and Semon, Warren L., 3,885,233.
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Montag, Lloyd D.: *See—*
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Montavon, Marc: *See—*
Bernauer, Karl; Borgulya, Janos; Montavon, Marc; Breitschneider, Hermann; Hohenlohe-Oehringen, Kraft; and Weis, Gunter, 3,884,976.

Monteil, Andre: *See—*
Mauvernay, Roland-Yves; Bush, Norbert; Moleyre, Jacques; Monteil, Andre; and Simond, Jacques, 3,884,923.

Montgomery, Donald R., to Union Carbide Corporation. Vinyl copolymers and processes for making them. 3,884,887, Cl. 260-80.750.

Montgomery, Ronald Eugene; and Incho, Harry Hobart, to FMC Corporation. Insecticidal compositions and methods of combatting insects using cyclopropane carboxylate insecticides with a synergistic compound of mono (alkyl and alkenyl) mono omega-alkynyl arylphosphonates. 3,885,031, Cl. 424-192.000.

Moog Inc.: *See—*
Grouwinkel, George F.; and Hager, James W., 3,884,267.

Moolenaar, Robert J.: *See—*
Bon, Charles K.; and Moolenaar, Robert J., 3,884,839.

Mooney, Daniel L., to Ampex Corporation. Fast acting direct current clamping circuit. 3,885,093, Cl. 178-7.3DC.

Moore, Alvin Edward. Insulated, tube-framed boat or the like. 3,883,911, Cl. 9-6.000.

Moore, Alvin Edward. Light-weight, durable, land-traversing vehicle. 3,884,521, Cl. 296-31.00P.

Moore, George Paul. Laryngoscope. 3,884,222, Cl. 128-11.000.

Morawetz, Gottfried, to Ciba-Geigy Corporation. Processing of thermoplastic polyesters. 3,884,858, Cl. 260-29.15B.

Morgan Adhesives Company: *See—*
Miller, James A., 3,884,505.

Morgan Construction Company: *See—*
Rich, Charles A., Jr., 3,884,535.

Mori, Hisakazu: *See—*
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Mori, Shoichiro: *See—*
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Moriya, Nobuyoshi, to Mansei Kogyo Kabushiki Kaishya. Gas lighter. 3,884,614, Cl. 431-88.000.

Morozov, Sergei Nikolaevich: *See—*
Budker, Gersh Itskovich; Karliner, Marlen Moiseevich; Makarov, Ivan Grigorievich; Morozov, Sergei Nikolaevich; Nezhevenko, Oleg Alexandrovich; Ostreiko, Gennady Nikolaevich; and Shekhtman, Isai Abramovich, 3,885,193.

Morris, James C., to TRW Inc. Welding apparatus. 3,885,122, Cl. 219-98.000.

Morton, Douglas R.: *See—*
Johnson, William S.; Morton, Douglas R.; and Gravestock, Michael B., 3,884,945.

Morton, Hershel D. Portable table-top miniature golf game provided with rearrangeable hole modules and separate green putting board. 3,884,469, Cl. 273-87.200.

Moser, Hermann; and Pils, Walter, to Hoechst Aktiengesellschaft. Interlock device for auxiliary counting circuit in reproduction apparatus. 3,885,166, Cl. 307-116.000.

Moses, Adrian, to Lear Siegler, Inc. Light dimmer. 3,885,197, Cl. 315-194.000.

Motier, John F.; and Marion, Donald L., to Atlantic Richfield Company. Electrocoating composition containing styrene-maleic anhydride copolymer and epoxy ester resin exhibiting high throwing power. 3,884,856, Cl. 260-23.0EP.

Motohashi, Katsuichi: *See—*
Ozutsumi, Minoru; Miyazawa, Yoshihide; Motohashi, Katsuichi; Kiritani, Masatake; and Watanabe, Akio, 3,884,506.

Motorola, Inc.: *See—*
Schoenfelder, George A., 3,885,174.

Mottes, Yaacov. Tensiometer. 3,884,067, Cl. 73-73.000.

Moulton, Eric W.; and Rogers, Waldo I., to Rusco Industries, Inc. Value/use control and identification system for magnetic cards. 3,885,130, Cl. 235-61.11D.

Moyer, James L., to Great Canadian Oil Sands, Ltd. Methods and compositions for refining bituminous froth recovered from tar sands. 3,884,829, Cl. 252-331.000.

Moyle, Clarence L., to Dow Chemical Company, The. Antimicrobial thienyliodonium salt methods and compositions. 3,885,036, Cl. 424-275.000.

MPC/Kurgisil: *See—*
Bazell, Seymour; Ostensen, Ralph G.; Goldberg, Edward M.; and Walker, Robert D., 3,884,242.

Muellner, Donald R.; and Piercy, Richard J., to Caterpillar Tractor Co. Lift arm assembly for loader vehicles. 3,884,378, Cl. 214-769.000.

Mulder, Rudolf; and Handele, Martin Jacob, to U.S. Philips Corporation. Benzylidenesemicarbazide compounds having insecticidal activity. 3,885,042, Cl. 424-323.000.

Mulholland, Robert P., to Monarch Marking Systems, Inc. Portable data set. 3,884,342, Cl. 197-186.00R.

Mull, Leonard E. Retractable bathroom fixture. 3,884,258, Cl. 137-360.000.

Muller, Johann: *See—*
Hoppe, Peter; Drouven, Gustav; Leyer, Helmut; and Muller, Johann, 3,884,169.

Muller, Johannes, to Handtmann, Albert; and Metallgubwerk, Armaturen-und Fleischereimaschinen Fabrik. Apparatus for filling tubular casings. 3,883,925, Cl. 17-33.000.

Muller, Rolf: *See—*
Staudt, Heinrich; Ritter, Ernst; Jaenke, Hans-Jurgen; and Muller, Rolf, 3,884,205.

Multifastener Corporation: *See—*
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Munakata, Tomohiko: *See—*
Nakanishi, Michio; Munakata, Tomohiko; Maruyama, Yutaka; and Setoguchi, Shinro, 3,884,922.

Munro, James M.; and Gill, Donald. Railroad board game. 3,884,475, Cl. 273-134.00G.

Munzer, Horst: *See—*
Gallion, Georg A.; Weichsler, Klaus; Hullmann, Horst; and Munzer, Horst, 3,884,516.

Murata, Hikaru; Umeda, Yasuji; Sakurai, Yasusada; and Doi, Yasuo, to Kayabakogyokabushikikaisha. Hydraulic control valve. 3,884,253, Cl. 137-110.000.

Murayama, Keisuke; Higashida, Susumu; and Matsui, Katsuaki, to Sankyo Company Limited. 4-Piperidone derivatives, their preparation and their use as stabilizers. 3,884,912, Cl. 260-240.00F.

Murtin, Fernand R. C.; and Mercier, Loic, to Societe Industrielle d'Electronique et d'Informatique. Electronic control system for internal combustion engine. 3,884,195, Cl. 123-32.0EA.

Mussinan, Cynthia J.; Vock, Manfred; Shuster, Edward Joseph; and Quinn, Alton Dewitt, to International Flavors & Fragrances Inc. Flavoring and aromatising with 3-acetyl-2,5-dialkyl furans or thiophenes. 3,885,051, Cl. 426-535.000.

Myers-Sherman Company: *See—*
Shaddock, Roland E., 3,884,528.

N. F. Doweave, Inc.: *See—*
Dow, Norris F., 3,884,429.

N L Industries, Inc.: *See—*
Herman, Daniel F.; and Simone, Dominic, 3,884,871.

Naarden International, N.V.: *See—*
Maessen, Jan Th. M. F.; and DeRijke, David, 3,884,841.

Nadelson, Jeffrey: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 3,884,961.

Nadkarni, Anil V.; and Klar, Erhard, to SCM Corporation. Dispersion strengthening of metals by in-can processing. 3,884,676, Cl. 75-.5BC.

Nagai, Shoichi: *See—*
Ono, Michikaze; Ito, Toshio; Nagai, Shoichi; and Mizuno, Hironaga, 3,885,015.

Nagase, Shunji; Baba, Hajime; Kodaira, Kazuo; and Okazaki, Kooshi, to Agency of Industrial Science & Technology. Electrolytic process for production of chlorofluorinated ethers. 3,884,775, Cl. 204-59.00F.

Nagy, Lajos: *See—*
Wack, Geza; Nagy, Lajos; Szekely, Denes; Szolnoky, Jozsef; Udvardy-Nagy, Eva; and Zsoka, Erzsebet, 3,884,762.

Najmann, Knut K.: *See—*
Baitinger, Utz G.; and Najmann, Knut K., 3,884,732.

Nakagawa, Jihei, to Olympus Optical Co., Ltd. Retrofocus wide-angle lens system. 3,884,556, Cl. 350-214.000.

Nakaguchi, Glenn M., to Union Oil Company of California. Detergent automotive fuel composition. 3,884,647, Cl. 44-72.000.

Nakamura, Shirozi, to Tokyo Juki Kobyo Kabushiki Kaisha. Cloth-presser mechanism in a sewing machine. 3,884,164, Cl. 112-70.000.

Nakamura, Sumio, to Olympus Optical Co., Ltd. Macrolens. 3,884,557, Cl. 350-221.000.

Nakanishi, Michio; Munakata, Tomohiko; Maruyama, Yutaka; and Setoguchi, Shinro, to Yoshitomi Pharmaceutical Industry, Ltd. 11-(4-pyridylalkyl-piperazino)-dibenzothiepines. 3,884,922, Cl. 260-268.0TR.

Nakao, Yoshio; Kuno, Mitsuzo; and Suzuki, Masaru, to Takeda Chemical Industries, Ltd. Method for producing ergosterol and its esters. 3,884,759, Cl. 195-28.00R.

Nakashima, Shigeo. Automatic bag feeding device equipped with an automatic charging device. 3,884,278, Cl. 141-67.000.

Nakatani, Mitsuo, to Sanyo Electric Company, Ltd. Scanning device. 3,885,245, Cl. 360-101.000.

Nakazawa, Mitsunobu: *See—*
Inoue, Eiichi; and Nakazawa, Mitsunobu, 3,884,697.

Nalle, George S., Jr. Open tube with net overlay. 3,884,753, Cl. 428-36.000.

Namba, Yoshiharu, to Fuji Xerox Co., Ltd. Paper feeding device for a duplicating machine. 3,884,103, Cl. 83-156.000.

Nard Institute, Ltd.: *See—*
Arakawa, Morimasa; Katanosaka, Akisato; Hanamoto, Manabu; and Ohtsubo, Jyunichiro, 3,884,970.

National Research Development Corporation: *See—*
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Pobgee, Peter John, 3,885,097.

National Steel Corporation: *See—*
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Smith, Robert B., 3,885,018.

Nawa, Hideo: *See—*
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Naylor, Bertram L., III. Boat for scuba divers and the like. 3,883,910, Cl. 9-6.000.

Negita, Michihiko; and Kikuchi, Yoshiyasu, to Nippon Electric Company Limited. Document scanning apparatus. 3,885,229, Cl. 340-146.30H.

Nelson, Evan Herbert; and Rigden, Sydney Alfred Richard, to General Electric Company Limited, The. Electric discharge lamps. 3,885,181, Cl. 313-110.000.

Nemschoff, Mark S., to FMC Corporation. Noise controlling housing. 3,884,322, Cl. 181-33.00K.

Nesty, Glenn A.: *See—*
Carlson, Richard W.; and Nesty, Glenn A., 3,884,411.

Neville, Richard E. G., to AMF Incorporated. Gas heated rotary drier. 3,883,959, Cl. 34-48.000.

Newton, David Frederick: *See—*
Leng, John Lindley; and Newton, David Frederick, 3,884,899.

Neylan, William J.; and Blomberg, Harvey. Package and reflector assembly for a light source. 3,884,560, Cl. 350-293.000.

Neyret, Guy, to Etablissements Genoud & Cie Societe Anonyme. Lighter with head rotatable for flame adjustment. 3,884,616, Cl. 431-142.000.

Neyret, Guy, to Establissements Genoud & Cie. Gas lighters. 3,884,618, Cl. 431-254.000.

Nezhevenko, Oleg Alexandrovich: *See—*
Budker, Gersh Itskovich; Karliner, Marlen Moiseevich; Makarov, Ivan Grigorievich; Morozov, Sergei Nikolaevich; Nezhevenko, Oleg Alexandrovich; Ostreiko, Gennady Nikolaevich; and Shekhtman, Isai Abramovich, 3,885,193.

Niccolai, Adriano: *See—*
Castoldi, Fabrizio; Cattaneo, Serrio; and Niccolai, Adriano, 3,884,339.

Nichols, Richard A. Vapor recovery with ambient cooling. 3,884,652, Cl. 55-88.000.

Nichols, Richard P. Helicopter hydraulic oil system. 3,884,434, Cl. 244-53.00R.

Nicoll, Frank S., Jr. Building formed of precut, foldable site erected paper board. 3,883,999, Cl. 52-90.000.

Nidy, Eldon George: *See—*
Kornis, Gabriel; Steinhards, Arnolds; Nidy, Eldon George; and Vostral, Henry J., 3,884,934.

Niederer, Kurt W., to W. Schlafhorst & Co. Knit fabric incorporating a weft stitch weave. 3,884,053, Cl. 66-192.000.

Niederer, Kurt W., to W. Schlafhorst & Co. Knit fabric incorporating a warp stitch weave. 3,884,054, Cl. 66-193.000.

Nielsen, Edwin A.: *See—*
Joshi, Madhusudan; Nielsen, Edwin A.; and Ventura, Frank D., 3,883,987.

Niemegeers, Carlos Jan Ernest Josef: *See—*
Janssen, Paul Adriaan Jan; Niemegeers, Carlos Jan Ernest Josef; Stokbroekx, Raymond Antoine; and Vandenberk, Jan, 3,884,916.

Nihon Denshi Kabushiki Kaisha: *See—*
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Nikolishvili, Georgy Alexeevich: *See—*
Gogorishvili, Platon Vladimirovich; Geleishvili, Tengiz Pavlovich; Zarkua, Nina Porfirievna; Nikolishvili, Georgy Alexeevich; Dundua, Rusudan Georgievna; Svintidze, Nadezhda Georgievna; Onuchkina, Nina Ivanovna; Kasradze, Gaioz Grigorievich; and Kuperman, Genrikh Moiseevich, 3,883,908.

Nikolov, Ivan Dimov: *See—*
Balevski, Angel Tontchev; and Nikolov, Ivan Dimov, 3,884,291.

Nilsson, Rune, to AB Linde International. Apparatus for regulating the control current to the electric brake system of a trailer. 3,884,530, Cl. 303-7.000.

Ninke, William Herbert; and Ritchie, George Ray, to Bell Telephone Laboratories, Incorporated. Binary rate multipliers. 3,885,142, Cl. 235-164.000.

Nippon Electric Company Limited: *See—*
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Nippon Kogaku K.K.: *See—*
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Nippon Kokan Kabushiki Kaisha: *See—*
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Nippon Kynol Inc.: *See—*
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Nippon Steel Glass Co. Ltd.: *See—*
Baba, Yuji, 3,884,559.

Nippon Telegraph and Telephone Public Corporation: *See—*
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Nippon Tsu Shin Kogyo K.K.: *See—*
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Nippon Zeon Co., Ltd.: *See—*
Go, Tadahiro; Yaginuma, Hiroshi; and Inoue, Masaaki, 3,884,712.

Nishimura Seisakusho Co., Ltd.: *See—*
Hashimoto, Kenzo; and Wada, Kimihiro, 3,884,427.

Nishino, Tsutomu: *See—*
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Nissan Motor Company Limited: *See—*
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Kobayashi, Kazuaki; Okuno, Tatsujiro; Katayama, Shinya; and Kita, Takehiko, 3,885,003.
Oka, Takashi; and Sato, Kazuma, 3,884,499.
Sakaki, Yoshihiro, 3,884,087.
Sugiyama, Hiroshi; and Numagami, Kiyoshi, 3,885,126.
Takeuchi, Yasuhisa; and Iizuka, Haruhiko, 3,884,531.

Nite, Rebecca F.: *See—*
Phares, Russell E., Jr.; and Nite, Rebecca F., 3,884,826.

Nohara, Haruo; Makino, Junichi; and Masuda, Manabu, to Hitachi, Ltd. Protective relaying device. 3,885,199, Cl. 317-27.00R.

Nolte, Karl-Heinz: *See—*
Knappe, Heinrich; Nolte, Karl-Heinz; and Kempelmann, Reinhold, 3,884,402.

Nonnet, Jean: *See—*
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Nonogaki, Saburo: *See—*
Hirai, Takako; Hatano, Yoshio; Nonogaki, Saburo; and Kobayashi, Teruaki, 3,885,060.

Norfleet, James; and Clipper, Donald W., to Colgate-Palmolive Company. Dentifrice preparation. 3,885,029, Cl. 424-57.000.

Norman, Gerald F.; and Osborne, William E., to Marlin Firearms Company, The. Safe quick-release lock of cartridge feed unit to magazine of firearm. 3,883,976, Cl. 42-49.00R.

Norton Company: *See—*
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Norton, Paul D.: *See—*
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Nosco Plastics, Incorporated: *See—*
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Numagami, Kiyoshi: *See—*
Sugiyama, Hiroshi; and Numagami, Kiyoshi, 3,885,126.

Oba, Yoichi; and Tsunoda, Teruo, to Hitachi, Ltd. Bisazide sensitized photoresistor composition with diacetone acrylamide. 3,884,703, Cl. 96-115.00R.

Oberender, Heinz; and Vogelsberg, Dieter, to Siemens Aktiengesellschaft. Method and apparatus for making SZ-twisted communications cable. 3,884,025, Cl. 57-34.0AT.

Oelze, Carl O.: *See—*
Woerner, Rudolph C.; Tschopp, Lloyd D.; and Oelze, Carl O., 3,884,650.

Oestreich, Ulrich; and Katzschner, Wolfgang, to Siemens Aktiengesellschaft. Twisting device for the SZ twisting of electrical cables. 3,884,024, Cl. 57-34.0AT.

Ohashi, Taro. Automatic sharpening device. 3,883,995, Cl. 51-91.0BS.

Ohlenbusch, Cord W.: *See—*
Jerard, Robert B.; and Ohlenbusch, Cord W., 3,883,900.

Ohlidal, Vladimir: *See—*
Ripka, Josef; Junek, Jan; Vobornik, Vaclav; Lihtarova, Ludmila; Hortlik, Frantisek; Brynda, Vaclav; Ohlidal, Vladimir; Korbar, Zdenek; and Vecera, Milos, 3,884,029.

Ohmura, Ryuichi, to Fuji Kogyo Co., Ltd. Device for mounting fishing reels to fishing tackle. 3,883,978, Cl. 43-22.000.

Ohno, Genji; and Inoue, Eiichi, to Research and Development Laboratories of Ohno Co., Ltd. Electrostatic developing process employing a porous photoconductive member. 3,884,684, Cl. 96-1.0LY.

Ohtsubo, Jyunichiro: *See*—
Arakawa, Morimasa; Katanosaka, Akisato; Hanamoto, Manabu; and Ohtsubo, Jyunichiro, 3,884,970.

Oilgear Company, The: *See*—
Pourian, Reza, 3,884,039.

Oka, Takashi; and Sato, Kazuma, to Nissan Motor Company Limited. Discharge valve for vehicle safety apparatus. 3,884,499, Cl. 280-150.0AB.

Okazaki, Kooshi: *See*—
Nagase, Shunji; Baba, Hajime; Kodaira, Kazuo; and Okazaki, Kooshi, 3,884,775.

Okazaki, Yoshimi: *See*—
Shimada, Fumitaka; Ikekawa, Tetsuro; Endo, Tomio; Kuroda, Hideo; Ikeda, Yoshiaki; Tachibana, Kooichi; and Okazaki, Yoshimi, 3,884,911.

Okubo, Akira: *See*—
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Okuno, Tatsujiro: *See*—
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Okura Kogyo Kabushiki Kaisha: *See*—
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Olcutt, Eugene L., to Atlantic Research Corporation. Pre-stressed pyrolytic graphite-refractory carbide microcomposites. 3,885,073, Cl. 428-112.000.

Olin Corporation: *See*—
Check, Donald R., 3,883,964.
Kober, Ehrenfried H.; Martin, Richard H.; and Raymond, Maurice A., 3,884,952.

Olin, John F., to Monsanto Company. Herbicidal 2-halo-n-(acyloxyalkylene) acetanilides. 3,884,673, Cl. 71-106.000.

Olin Mathieson Chemical Corporation: *See*—
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Oliver Tire & Rubber Company: *See*—
Hindin, Herbert B.; Johnson, Alfred E.; and Knapp, Donald P., 3,884,739.

Olsen, Larry C.; and Scott, Howard W., to McDonnell Douglas Corporation. Process for expanding pyrolytic graphite. 3,885,007, Cl. 264-42.000.

Olson, Eugene E.: *See*—
Clendenen, Ronald L.; Olson, Eugene E.; and Schlaudt, Charles M., 3,884,823.

Olson, Paul E., to American Standard Incorporated. Tool for notching the edge of frangible sheet material. 3,884,405, Cl. 225-102.000.

Olszewski, Jerzy A.: *See*—
Jachimowicz, Ludwik; and Olszewski, Jerzy A., 3,885,083.

Olympus Optical Co., Ltd.: *See*—
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Nakamura, Sumio, 3,884,557.

O'Malley, Conor C.; and Heintz, Ralph M., Sr. Apparatus for intraocular surgery. 3,884,237, Cl. 128-303.140.

O'Malley, Conor C.; and Heintz, Ralph M., Sr. Apparatus for intraocular surgery. 3,884,238, Cl. 128-305.000.

O'Nan, Glenn S.; Slicer, Allan E.; and Jorgensen, George N., to Square D Company. Assembly for connecting a current take-off unit to a plurality of bus bars. 3,884,541, Cl. 339-22.00B.

Onderwater, Adrianus: *See*—
Spaans, Johannes; and Onderwater, Adrianus, 3,884,802.

O'Neill, Patrick; and Douglas, Patrick Joseph, to Powerscreen International Limited. Conveyor unit. 3,884,346, Cl. 198-99.000.

Ono, Michikaze; Ito, Toshio; Nagai, Shoichi; and Mizuno, Hironaga, to Mitsubishi Rayon Co., Ltd. Method of processing a heat-shrinkable sheet-like material. 3,885,015, Cl. 264-230.000.

Onuchkina, Nina Ivanovna: *See*—
Gogorishvili, Platon Vladimirovich; Geleishvili, Tengiz Pavlovich; Zarkua, Nina Porfirievna; Nikolishvili, Georgy Alexeevich; Dundua, Rusudan Georgievna; Svintidze, Nadezhda Georgievna; Onuchkina, Nina Ivanovna; Kasradze, Gaioz Grigorievich; and Kuperman, Genrikh Moiseevich, 3,883,908.

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Ooya, Junichiro; Sakakibara, Naoji; Kawabata, Yasuhiro; Nawa, Hideo; Hida, Takashi; Tarao, Akira; Tsukuba, Korehiko; and Kuwana, Kazutaka, to Aisin Seiki Kabushiki Kaisha. Method and system for constant-speed running of vehicles. 3,885,137, Cl. 235-150.200.

Oppel, John A.: *See*—
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Opti-Holding AG: *See*—
Heimberger, Helmut, 3,884,168.

Orisek, Timothy R. Loudspeaker and enclosure assembly. 3,884,326, Cl. 181-155.000.

Osborne, William E.: *See*—
Norman, Gerald F.; and Osborne, William E., 3,883,976.

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Ostreiko, Gennady Nikolaevich: *See*—
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Ostrowski, Henry S., to Fiber Industries, Inc. Continuous atmospheric depolymerization of polyester. 3,884,850, Cl. 260-2.300.

Oswald, Alexis A., to Exxon Research & Engineering Company. Thioether isocyanate adducts. 3,884,951, Cl. 260-453.00A.

Oswald, Alexis A.: *See*—
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Ota, Yoshio: *See*—
Tsurushima, Katsuaki; Ota, Yoshio; and Takeda, Masashi, 3,885,099.

Otrhalek, Joseph V.; and Elfers, Gunther H., to BASF Wyandotte Corporation. Pigment dispersant in aqueous slurries. 3,884,964, Cl. 260-486.00R.

Otsuki, Susumu; Miyanohara, Isao; Mizui, Norimasa; and Kawamura, Hideo, to Toyo Soda Manufacturing Co., Ltd. Process for producing materials which complex heavy metals in liquid. 3,884,846, Cl. 260-2.20R.

Ott, John Nash, to John Ott Laboratories. Shielded luminaire. 3,885,150, Cl. 240-46.390.

Outboard Marine Corporation: *See*—
Dahl, Einar S.; and Kidd, Earl H., 3,884,020.
Larsen, Robert T., 3,884,174.

Ovalstrapping, Inc.: *See*—
Pasic, James A., 3,884,139.

Overbury, Francis Giles, to International Standard Electric Corporation. Doppler radio navigation beacon system adapted for angle determination using unmodified communication receiver. 3,885,241, Cl. 343-106.00D.

Owen, Kenneth. Balanced line switch system. 3,885,117, Cl. 200-153.00S.

Ozone Incorporated: *See*—
Schultz, Ronald A.; and Tenney, Robert I., 3,884,819.

Ozutsumi, Minoru; Miyazawa, Yoshihide; Motohashi, Katsuichi; Kiritani, Masatake; and Watanabe, Akio, to Fuji Photo Film Co., Ltd.; and Hodogaya Chemical Co., Ltd. Pressure-sensitive copying papers containing fluoran compounds. 3,884,506, Cl. 282-27.500.

P. R. Mallory & Co. Inc.: *See*—
Bertozzi, Marcello; and Chioffi, Mario, 3,884,088.
Wallis, George, 3,883,945.

Packard Becker BV: *See*—
Spaans, Johannes; and Onderwater, Adrianus, 3,884,802.

Pall Corporation: *See*—
Roach, Charles J., 3,884,658.

Palloch, Herbert, to Frankl and Kirchner. Electric motor variable speed and control drive. 3,885,175, Cl. 310-68.00D.

Palm, Lewis J.; and Palm, Ronald B., to Fulton Boiler Works, Inc. Method for electrically heating a heat transfer fluid. 3,885,125, Cl. 219-298.000.

Palm, Ronald B.: *See*—
Palm, Lewis J.; and Palm, Ronald B., 3,885,125.

Palmer, Bryan Harper: *See*—
Harrison, Ian Robert; McCarthy, John Felix; and Palmer, Bryan Harper, 3,884,968.

Palmer, Malcolm George; and Ball, Anthony Donald, to Albright & Wilson Limited. Phosphorus-containing compositions. 3,884,734, Cl. 149-6.000.

Palsson, Jan F., to Tetra Pak Developement S.A. Method of, and means for folding a container blank into a tubular body. 3,884,131, Cl. 93-49.00M.

Palz, Wolfgang: *See*—
Duy, Thuoc Nguyen; and Palz, Wolfgang, 3,884,779.
Duy, Thuoc Nguyen; Palz, Wolfgang; and Vedel, Jacques, 3,885,058.

Pander, Hans Joachim: *See*—
Zeeh, Bernd; Jung, Johann; and Pander, Hans Joachim, 3,884,670.

Pankoke, Christa. Machine for the manufacture of wood fibre panels in continuous lengths. 3,884,749, Cl. 156-501.000.

Paquette, Elmer G.: *See*—
Guenther, Karl R.; and Paquette, Elmer G., 3,884,354.

Parker-Hannifin Corporation: *See*—
Millar, James S.; and Henderson, Glenn W., 3,884,448.

Parmann, Gunnar. Apparatus for bending thermoplastic pipes. 3,884,612, Cl. 425-384.000.

Parrino, George. Kaleidoscope. 3,884,547, Cl. 350-5.000.

Parsons, Donald S.: *See*—
Harris, Geoffrey Lyall; and Parsons, Donald S., 3,885,022.

Pasic, James A., to Ovalstrapping, Inc. Wire feeding and tensioning apparatus. 3,884,139, Cl. 100-26.000.

Passmore, David G., to Lear Siegler, Inc. Air spring system and damped air valve therefor. 3,884,454, Cl. 263-65.00D.

Pastal, Nicholas: *See*—
Corboy, John Francis; Cullen, Glenn Wherry; and Pastal, Nicholas, 3,885,061.

Pastor, Gerald R.: *See*—
Bull, Willard C.; Wright, Charles H.; and Pastor, Gerald R., 3,884,794.
Wright, Charles H.; and Pastor, Gerald R., 3,884,795.

Patton, William L., to Affiliated Hospital Products, Inc. Method of assembly of catheter package. 3,884,011, Cl. 53-21.000.

Pauli, Ernest H., to Hilliard Corporation, The. Drive coupling. 3,884,049, Cl. 64-14.000.

Pauliukonis, Richard S. Automatic bar. 3,884,391, Cl. 222-129.400.

Paulson, Peter O. Frangible target. 3,884,470, Cl. 273-105.400.

Pauvlik, Jeanne Marie: *See—*
Jones, Peter Hadley; Martin, Jerry Roy; McAlpine, James Bruce; Pauvlik, Jeanne Marie; and Tadanier, John Soloman, 3,884,903.
Jones, Peter Hadley; McAlpine, James Bruce; Pauvlik, Jeanne Marie; and Perun, Thomas John, 3,884,904.

Pavlica, Zdenek, to Elitex, Zavody textilniho strojirenstvi generalni reditelstvi. Dobby. 3,884,273, Cl. 139-71.000.

Payet, George L.; and Brummet, Berthal D., to McGraw-Edison Company. Continuous durable-press processing of fabric and garments. 3,884,632, Cl. 8-116.400.

Pearce, Jai K.; and Eichinger, Frithjof, to Pennsylvania Engineering Corporation. Bottom blown steel converter and means for controlling injection of powdered material with process gasses therein. 3,884,453, Cl. 266-35.000.

Pearson-Coleman, Arthur James: *See—*
Chattaway, George Anthony; and Pearson-Coleman, Arthur James, 3,884,811.

Pease, Lionel. Salvage machine and harvester. 3,884,281, Cl. 144-218.000.

Pecksen, Otto: *See—*
Madlener, Paul; and Pecksen, Otto, 3,884,151.

Pedersen, Kristen I., to Sofec, Inc. Submerged hose arm stabilizing means for single point mooring systems. 3,883,912, Cl. 9-8.00P.

Pelabon, Andre E., to ANF-Frangeco S.A. Railway car bogie. 3,884,157, Cl. 105-199.00R.

Penfold, Alan S.; and Thornton, John A., to Telic Corporation. Electrode type glow discharge apparatus. 3,884,793, Cl. 204-298.000.

Pennsylvania Engineering Corporation: *See—*
Pearce, Jai K.; and Eichinger, Frithjof, 3,884,453.

Perez, Jean-Jacques: *See—*
Berthelot, Guy; Guillot, Philippe; and Perez, Jean-Jacques, 3,885,208.

Perrotti, Emilio: *See—*
Koch, Paolo; and Perrotti, Emilio, 3,885,024.

Perrussel, Russell E.: *See—*
Hinderliter, Charles R.; and Perrussel, Russell E., 3,884,796.

Perry Equipment Corporation: *See—*
Perry, Marney Dunman, Jr.; and Graff, Robert A., 3,884,660.

Perry, James E.: *See—*
Franks, Lawrence A.; and Perry, James E., 3,885,165.

Perry, Marney Dunman, Jr.; and Graff, Robert A., to Perry Equipment Corporation. Gas-liquid separator. 3,884,660, Cl. 55-396.000.

Personal Communications, Inc.: *See—*
Waly, Adnan, 3,884,570.

Perun, Thomas John: *See—*
Jones, Peter Hadley; McAlpine, James Bruce; Pauvlik, Jeanne Marie; and Perun, Thomas John, 3,884,904.

Pessolano, Richard L.; and Rhodes, Robin B., to Isothermics, Inc. Air-o-space heater means for recovering heat from a fluid steam. 3,884,292, Cl. 165-39.000.

Pessolano, Richard L.; and Rhodes, Robin B., to Isothermics, Inc. Cooling means. 3,884,293, Cl. 165-51.000.

Peters, Clas. Syringe having pivotable nozzle portion. 3,884,231, Cl. 128-235.000.

Peterson, Everett A., to Peterson, Everett A. Zipper structure. 3,883,931, Cl. 24-205.11R.

Peterson, Wilbur E., to Harmony Enterprises, Inc. Drive mechanism for collapsible camping vehicles. 3,884,520, Cl. 296-27.000.

Petock, Michael F. Walker. 3,884,495, Cl. 280-87.02W.

Petro-Tex Chemical Corporation: *See—*
Woerner, Rudolph C.; Tschopp, Lloyd D.; and Oelze, Carl O., 3,884,650.

Petros, Andrew J.; and Pizzedaz, Ronald D., to Mesta Machine Company. Roll positioning mechanism for rolling mills. 3,884,064, Cl. 72-245.000.

Petrov, Evgeny Vasilievich: *See—*
Chernov, Evgeny Alexandrovich; Poletaev, Arkady Nikolaevich; Golod, Saul Vulfovich; Petrov, Evgeny Vasilievich; Vasiliev, Dmitry Timofeevich; and Tofpenets, Vitold Antonovich, 3,884,122.

Pfab, Diethard, to Siemens Aktiengesellschaft. Superheterodyne receiver having a digital indication of the received frequency. 3,885,218, Cl. 325-455.000.

Pfeiffer and Langen: *See—*
Schneider, Hans-Georg; and Mikule, Jiri, 3,884,714.

Pfenninger, Hans, to BBC Brown Boveri & Company Limited. Steam plant with pressure-fired boiler. 3,884,036, Cl. 60-39.18B.

Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., to Syntex (U.S.A.) Inc. Method of using substituted xanthone carboxylic acid. 3,885,038, Cl. 424-283.000.

Pfizer Inc.: *See—*
Celmer, Walter D.; Cullen, Walter P.; and Routien, John B., 3,884,763.
Koch, Richard C.; and Richards, Hugh C., 3,884,962.

Pfluger, Erich: *See—*
Mitteldorf, Rudolf; Pfluger, Erich; and Steinicke, Werner, 3,884,679.

Phares, Russell E., Jr.; and Nite, Rebecca F., to Barnes-Hind Pharmaceuticals, Inc. Thixotropic cleaning agent for hard contact lenses. 3,884,826, Cl. 252-106.000.

Phelon, Russell D.; and Van Amsterdam, John C., to R. E. Phelon Company, Incorporated. Pole-shoe magnet group for a magnetomotive device. 3,885,177, Cl. 310-153.000.

Phelps Dodge Industries, Inc.: *See—*
Trice, Robert T.; McLeod, Gordon D.; Anderson, Amos R.; and Wilson, Dennis C., 3,884,868.

Phelps Dodge Magnet Wire Corporation: *See—*
Disque, Donny R.; and Koerner, Ernest C., 3,884,880.

Phillips Petroleum Company: *See—*
Barber, F. Taylor, 3,885,002.
Bresson, Clarence R.; and Spaulding, Forrest D., 3,885,068.
Fluegal, Dale A., 3,885,220.
Gray, Peter R.; and Leroy, Billy J., 3,885,023.
Hsieh, Henry L., 3,884,889.
Moberly, Charles W., 3,884,883.
Scoggins, Lacey E.; and Campbell, Robert W., 3,884,884.
Short, James N., 3,884,873.
Windle, Tom J., 3,884,070.

Phillips, Ronald L., to General Motors Corporation. Rotary engine oil seal assembly. 3,884,602, Cl. 418-142.000.

Picker, Amos; and Feist, Wolfgang, to Raytheon Company. Cathode ray tube monoscope with semiconductor target. 3,885,189, Cl. 313-401.000.

Pierce Chemical Company: *See—*
Gindler, E. Melvin, 3,884,637.

Pierce, Ogden R.: *See—*
Kim, Yung Ki; and Pierce, Ogden R., 3,884,875.

Piercy, Richard J.: *See—*
Muellner, Donald R.; and Piercy, Richard J., 3,884,378.

Piesch, Ernst: *See—*
Jahn, Walter; and Piesch, Ernst, 3,885,159.

Pike, Ian Holden, to Imperial Chemical Industries Limited. Method of conserving forage with formalin and acid mixture. 3,885,055, Cl. 426-335.000.

Pilgram, Kurt H. G., to Shell Oil Company. Triazolinones. 3,884,910, Cl. 260-240.00G.

Pilkington Brothers Limited: *See—*
Friend, Harry Frederick, 3,884,669.

Pils, Walter: *See—*
Moser, Hermann; and Pils, Walter, 3,885,166.

Pilz, William M., III.; and Gardner, Jeffrey M., to Container Corporation of America. Book mailer. 3,884,352, Cl. 206-424.000.

Pinkowski, Norman J.; Freiman, Aaron; and Beiter, Charles B., to M & I Chemicals Inc. Antifouling compositions. 3,885,039, Cl. 424-288.000.

Pinkowski, Norman J.: *See—*
Eckert, Charles F.; and Pinkowski, Norman J., 3,884,895.

Pitney-Bowes, Inc.: *See—*
Ryland, Peter M., 3,884,458.
Sette, Paul R.; and Storace, Anthony, 3,884,745.
Tramposch, Herbert; and Hubbard, David W., 3,884,340.

Pittman, Tobe A.; and Woods, Jack L. Electrolytic copper recovery method and electrolyte. 3,884,782, Cl. 204-108.000.

Pivar, Stewart, to Rototron Corporation. Process for molding hollow thermoplastic articles and resulting articles. 3,885,016, Cl. 264-269.000.

Pizzedaz, Ronald D.: *See—*
Petros, Andrew J.; and Pizzedaz, Ronald D., 3,884,064.

Planet Corporation: *See—*
Smith, Robert J., 3,884,604.

Plessey Handel und Investments A.G.: *See—*
Sheffield, Bernard Raymond; and Goodinge, Mark Wallinger, 3,884,417.

Plisky, John J.: *See—*
Harbison, William H.; Plisky, John J.; and Mohnach, Michael G., 3,883,920.

Plock, Karl: *See—*
Rademacher, Friedrich; Quest, Karl; Knabe, Uwe; Unger, Dieter; Jordan, Heinz; Heckmann, Werner; and Plock, Karl, 3,884,277.

Plueddemann, Edwin P., to Dow Corning Corporation. Cationic unsaturated amine-functional silane coupling agents. 3,884,886, Cl. 260-80.0PS.

Plunguian, Mark; and Cornwell, Charles E. Process for forming foamed polyester resins. 3,884,844, Cl. 260-2.50N.

Pobgee, Peter John, to National Research Development Corporation. Graphical input apparatus for electrical apparatus. 3,885,097, Cl. 178-18.000.

Poehlmann, Paul W., to H. Koch and Sons, Inc. Gas-actuated emergency pilot release system. 3,884,436, Cl. 244-122.00A.

Pohl, Stanley: *See—*
Brody, Frederick; and Pohl, Stanley, 3,884,627.

Poirier, Real J., Jr.: *See—*
Poirier, Real J., Sr.; and Poirier, Real J., Jr., 3,883,965.

Poirier, Real J., Sr.; and Poirier, Real J., Jr. Snow plow frame. 3,883,965, Cl. 37-42.00R.

Polaroid Corporation: *See—*
Land, Edwin H., 3,884,562.

Polek, Joseph R.: *See—*
Coughlin, Robert W.; and Polek, Joseph R., 3,884,806.

Poletaev, Arkady Nikolaevich: *See—*
Chernov, Evgeny Alexandrovich; Poletaev, Arkady Nikolaevich; Golod, Saul Vulfovich; Petrov, Evgeny Vasilievich; Vasiliev, Dmitry Timofeevich; and Tofpenets, Vitold Antonovich, 3,884,122.

Poletto, John Frank: *See—*
Bernady, Karel Francis; Poletto, John Frank; and Weiss, Martin Joseph, 3,884,953.

Polymer Machinery Corporation: *See—*
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Polytop Corporation: *See—*
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Hazard, Robert E., 3,884,392.

Hazard, Robert E., 3,884,394.

Pont-a-Mousson S.A.: *See*—
Bram, Georges Eugene, 3,884,510.

Poplaski, Daniel Eugene, to AMP Incorporated. Method and apparatus for forming paired leads having an intermediate twisted portion and untwisted end portions and for applying terminals or the like to the end portions. 3,884,276, Cl. 140-115.000.

Pottharst, John E., Jr. Multi-effect flash evaporator. 3,884,767, Cl. 202-174.000.

Pourian, Reza, to Oilgear Company, The. Hydraulic pump with horsepower limiter. 3,884,039, Cl. 60-445.000.

Powerscreen International Limited: *See*—
O'Neill, Patrick; and Douglas, Patrick Joseph, 3,884,346.

PPG Industries, Inc.: *See*—
Edge, Charles K.; and Kunkle, Gerald E., 3,884,665.
Raetzsch, Carl W.; and Cunningham, Hugh, 3,884,791.
Russell, David B.; and Doran, Thomas J., Jr., 3,884,285.
Schwenninger, Ronald L., 3,885,066.
Sheppard, Robert S.; and Groening, Franklin E., 3,885,021.
Zibritosky, George, 3,885,072.

Praska, George J., to Wright Products, Inc. Door latch mechanism. 3,884,514, Cl. 292-11.000.

Price, Nellie Peck. Clear view thread or yarn holder. 3,884,412, Cl. 229-69.000.

Priem, Jan Jozef: *See*—
Van Paesschen, August Jean; Van Gossum, Lucien Janbaptist; and Priem, Jan Jozef, 3,885,081.

Priest, John Ricks: *See*—
Ballard, Edward Cooper; and Priest, John Ricks, 3,884,857.

Pritchard, Dalton Harold; and Schroeder, Alfred Christian, to RCA Corporation. High voltage regulator. 3,885,198, Cl. 315-411.000.

Pritulsky, Leo J. Peg board game having player piece dislodging means. 3,884,473, Cl. 273-130.00D.

Prochnow, Claus; and Berger, Hans-Jurgen, to Rollei-Werke Franke & Heidecke. Container for high power generators of electronic photoflash apparatus. 3,884,380, Cl. 220-9.00F.

Propst, Robert L.; Stumpf, William E.; and Wodka, Michael A., to Herman Miller, Inc. Universal mounting for various signage. 3,883,972, Cl. 40-128.000.

Pruvost, Pierre; and Cluchat, Jacques, to Rhone-Poulenc, S.A. Process for the preparation of so-called cold-cured flexible polyurethane. 3,884,847, Cl. 260-2.5AH.

Pryor, Timothy R. Diffractographic and other sensors utilizing diffraction waves. 3,884,581, Cl. 356-109.000.

Pudovik, Svetlana Tikhonovna: *See*—
Samoilov, Sergei Mikhailovich; Monastyrsky, Viktor Nikolaevich; Pudovik, Svetlana Tikhonovna; and Kuznetsov, Evgeny Vasilievich, 3,884,891.

Pudzinsky, Mikhail Antonovich: *See*—
Zverev, Anatoly Ivanovich; Pudzinsky, Mikhail Antonovich; Shesternenkov, Viktor Ivanovich; and Dudnik, Mikhail Pvalovich, 3,884,415.

Pugin, Andre: *See*—
Von Der Crone, Jost; and Pugin, Andre, 3,884,955.

Pulimoottil, Mathew Mathew: *See*—
Pullukattu, Joseph Thomas; and Pulimoottil, Mathew Mathew, 3,884,675.

Pullan, Ronald Ernest, to Schlegel (UK) Limited. Edge protector strip and sealing strip. 3,883,993, Cl. 49-490.000.

Pullukat, Thomas J.; Shida, Mitsuzo; and Gillilan, Robert L., to Chemplex Company. Organotin chromate polymerization catalyst. 3,884,832, Cl. 252-429.00C.

Pullukattu, Joseph Thomas; and Pulimoottil, Mathew Mathew, to Kerala State Industrial Development Corporation. Production of titanium compounds from ores containing oxides of titanium and iron. 3,884,675, Cl. 75-1.000.

Pungs, Wolfgang: *See*—
Bruning, Klaus; Junger, Hans; Pungs, Wolfgang; Rheinfeld, Peter; Weissenfels, Franz; and Wienand, Michael, 3,885,010.

Puschel, Siegfried: *See*—
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Abels, Theodore; and Puschel, Siegfried, 3,885,204.

Quaglia, Andrea, to Minnesota Mining and Manufacturing Company. Silver halide emulsions containing two-equivalent benzoylacetanilide photographic couplers. 3,884,700, Cl. 96-100.000.

Quest, Karl: *See*—
Rademacher, Friedrich; Quest, Karl; Knabe, Uwe; Unger, Dieter; Jordan, Heinz; Heckmann, Werner; and Plock, Karl, 3,884,277.

Quinn, Alton Dewitt: *See*—
Mussinan, Cynthia J.; Vock, Manfred; Shuster, Edward Joseph; and Quinn, Alton Dewitt, 3,885,051.

R. E. Corporation: *See*—
Keenan, George R., 3,884,395.

R. E. Phelon Company, Incorporated: *See*—
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R. J. Brown & Associates Corporation: *See*—
Timmermans, Wilhelmus Jan, 3,884,043.

R. W. Hartnett Company: *See*—
Ackley, Edward M., 3,884,143.

Rabenhorst, David W., to Johns Hopkins University, The. Spoked disc flywheel. 3,884,093, Cl. 74-572.000.

Rademacher, Friedrich; Quest, Karl; Knabe, Uwe; Unger, Dieter; Jordan, Heinz; Heckmann, Werner; and Plock, Karl, to Holstein & Kappert Maschinenfabrik Phonix GmbH. Apparatus for filling beer cans or the like. 3,884,277, Cl. 141-59.000.

Radkowsky, Alvin, to United States of America, America as represented by the Energy Research and Development Administration. Neutronic flow meter. 3,885,156, Cl. 250-303.000.

Radler, Richard W., Jr., to Xerox Corporation. Polyester photoconductors and matrix materials. 3,884,690, Cl. 96-1.500.

Raether, Wolfgang: *See*—
Winkelmann, Erhardt; and Raether, Wolfgang, 3,884,913.

Raetzsch, Carl W.; and Cunningham, Hugh, to PPG Industries, Inc. Alkali metal chlorate cell having metal electrodes. 3,884,791, Cl. 204-268.000.

Raines, Kenneth; and Burke, George K., to Burron Medical Products, Inc. Hypodermic syringe and needle assembly. 3,884,229, Cl. 128-218.00N.

Rakestraw, Lawrence F., to Monsanto Company. Inviscid spinning of silicon steel. 3,884,289, Cl. 164-66.000.

Ralston Purina Company: *See*—
Starr, Robert P., 3,885,052.
Towry, Jack R., 3,884,136.

Rammler, Roland, to Metallgesellschaft Aktiengesellschaft. Process and apparatus for continuously heating fine-grained coal. 3,884,620, Cl. 432-15.000.

Ranco Incorporated: *See*—
Caldwell, Roland B., 3,884,200.

Randhava, Sarabjit Singh: *See*—
Fleming, Donald Kingsley; Randhava, Sarabjit Singh; and Camara, Elias Humberto, 3,884,838.

Ranocha, Jaromir; Repka, Dusan; and Machu, Bohumil, to Zavody elektrotepelnych zarizchi, hardoni podnik. Apparatus for welding shoe parts. 3,884,744, Cl. 156-351.000.

Rantell, Alan; and Holtzman, Abraham, to MacDermid Incorporated. Catalyst system for activating surfaces prior to electroless deposition. 3,884,704, Cl. 106-1.000.

Rasmussen, Jerome Jordan Michael; and Vou, David, to Union Carbide Corporation. Method for producing flexible regenerated cellulosic tubing and the tubing obtained therefrom. 3,884,270, Cl. 138-177.000.

Rauch, Francis Clyde: *See*—
Fanelli, Anthony Joseph; and Rauch, Francis Clyde, 3,884,975.

Raudebaugh, Stanley E. Steering wheel arm rest attachment. 3,884,092, Cl. 74-558.000.

Ravenscroft, Philip H.: *See*—
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Ray Cook Golf Putters, Inc.: *See*—
Cook, Raymon W., 3,884,468.

Ray, Frank M., to Flex-Kleen Corporation. Filter bag assembly for pulse jet collector. 3,884,659, Cl. 55-379.000.

Raybeck, Ralph M.; and Hines, Charles R., to Jones & Laughlin Steel Corporation. Method for determination of oil coating weights on non-oil absorbing surfaces. 3,884,084, Cl. 73-432.00R.

Raymond Lee Organization, Inc., The: *See*—
Buzan, Wendell P., 3,884,478.
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Raymond, Maurice A.: *See*—
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Raytheon Company: *See*—
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RCA Corporation: *See*—
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Fernsler, Ronald Eugene, 3,885,201.
Pritchard, Dalton Harold; and Schroeder, Alfred Christian, 3,885,198.
Sommer, Alfred Hermann, 3,884,539.
Thoman, Daniel Laverne, 3,884,007.

Rebajes, Francis. Mobile geometrical form. 3,884,462, Cl. 272-8.00R.

Rebours, Albert; and Carre, Christian, to Air-Industrie. Filtering devices with a least one filtering cavity. 3,884,657, Cl. 55-293.000.

Regan Offshore International, Inc.: *See*—
Watkins, Bruce J., 3,884,298.

Regents of the University of California: *See*—
Wang, Shyh; and Sheem, Sang K., 3,884,549.

Regie Autonome des Transports Parisiens: *See*—
Emeriat, Raymond, 3,884,152.

Reliance Electric Company: *See*—
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Remeika, Joseph Peter; and Voorhoeve, Rudolf Johannes H., to Bell Telephone Laboratories, Incorporated. Catalyst containing a perovskite-like manganite. 3,884,837, Cl. 252-462.000.

Renfrew, Edgar Earl; and Zanella, Dominic Andrew, to American Aniline Products, Incorporated. O-(benzyl or benzoyl)-benzoic acid-azo-phenyl compounds. 3,884,901, Cl. 260-207.000.

Rengo Co., Ltd: *See*—
Tokuno, Masateru, 3,884,345.

Renner, Alfred; and Hugi, Rolf, to Ciba-Geigy Corporation. Cyclic acetals containing epoxide groups. 3,884,944, Cl. 260-340.700.

Renoux, Gerard; and Renoux, Micheline, to Janssen Pharmaceutica N.V. Vaccine adjuvants. 3,885,011, Cl. 424-92.000.

Renoux, Micheline: *See*—
Renoux, Gerard; and Renoux, Micheline, 3,885,011.

Repka, Dusan: *See*—
Ranocha, Jaromir; Repka, Dusan; and Machu, Bohumil, 3,884,744.

Res-Q-Raft, Inc.: *See*—
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Research and Development Laboratories of Ohno Co., Ltd.: *See—*
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Research Development Systems, Inc.: *See—*
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Revlon, Inc.: *See—*
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Reynolds Metals Company: *See—*
Barkman, Erik F.; Jackson, John Harry; and Ward, Bennie Ray, Jr., 3,884,731.
Reynolds, Richard W.: *See—*
Sciaky, Albert M.; and Reynolds, Richard W., 3,885,123.
Reynolds, Rodney Kent. Flexible hanger clamp for electrical lamp socket. 3,883,926, Cl. 24-73.0CP.
Reynolds, Ronald: *See—*
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Rice, Jerry M. Twine cutting apparatus for a hay baler. 3,884,138, Cl. 100-5.000.
Rich, Charles A., Jr., to Morgan Construction Company. Seal. 3,884,535, Cl. 308-36.100.
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Ridgway, John A., Jr.; and Chao, Kwei C., to Standard Oil Company. Treatment of protein - containing microbial cells to remove undesirable flavor and odor substances. 3,885,050, Cl. 426-60.000.
Riedel, Tilo Herbert. Runaway guard device for skis. 3,884,488, Cl. 280-11.35N.
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Rivat-Lahousse, Andre, to Certain-teed Products Corporation. Method and apparatus for production of stratified sheets and articles of expanded thermoplastic materials. 3,885,009, Cl. 264-45.400.
Rivers, Charles F. Dumper. 3,884,376, Cl. 214-314.000.
Riviere, Donald L.; and Thomsen, Paul M., to Menasha Corporation. Temporary load retaining barricade for the doorway of a freight carrier. 3,884,287, Cl. 160-368.00G.
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Roberts, Earl J.; Brannan, Mary Ann F.; and Rowland, Stanley P., to United States of America, Agriculture. Tris (2-chloroethyl)phosphoramide— a crosslinking agent for cellulosic compositions. 3,884,972, Cl. 260-551.00P.
Roberts, Earl J.; and Rowland, Stanley P., to United States of America, Agriculture. Preparation of crosslinked polyethylenimine and impregnation of cellulosic material with in situ crosslink-polymerized ethylenimine. 3,885,069, Cl. 117-143.00A.
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Robertsson, Hans R., to Saab-Scania Aktiebolag. Sonic liquid level measuring apparatus. 3,884,074, Cl. 73-290.00V.
Robinson, Charles W.; and Merklin, Kenneth E., to Marcona Corporation. Hydrometallurgical leaching. 3,885,017, Cl. 423-1.000.
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Robinson, James V.; and Hill, Larry O., to Mead Corporation, The. Method of deodorizing animal wastes. 3,884,804, Cl. 210-64.000.
Robinson, Melvin P. Self-cleaning rake. 3,884,023, Cl. 56-400.100.
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Rochlitz, Jurgen, to Hoechst Aktiengesellschaft. Electrophotographic element of azo dye layer and charge transport overlayer. 3,884,691, Cl. 96-1.600.
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Romanski, Andrezej Antoni Florian; Allen, Michael John; Fletcher, John Malcolm; Laing, Ian Burnett; and Markham, Harry, to British Steel Corporation. Graphite-pitch electrode paste. 3,884,840, Cl. 252-511.000.
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Roosen, Raymond Albert. Photographic copying apparatus. 3,884,578, Cl. 355-100.000.

Ropitzky, Joseph, to United States of America, Army. Electrode and flux combination for submerged arc welding. 3,885,120, Cl. 219-73.000.

Rosenbaum, Richard W. Continuous automatic surveillance system. 3,885,090, Cl. 178-6.60A.

Rosenberger, Siegfried; and Schmidt, Andreas, to Ciba-Geigy Corporation. Diacyl-hydrazine stabilizers for polyolefins. 3,884,874, Cl. 260-45.85B.

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Rumell, James A. Railroad car with hydraulically actuated turntable. 3,884,158, Cl. 105-368.00B.

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Sakaki, Yoshihiro, to Nissan Motor Company Limited. Drive assembly for rotary heat regenerator. 3,884,087, Cl. 74-63.000.

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Sakata, Hiroshi; Asahara, Nakaba; Asai, Yasuhiko; and Hasegawa, Hirozo, to Unitika, Ltd. Aromatic co-polyester composition containing polyethylene oxybenzoate and aromatic phenolic polyester. 3,884,990, Cl. 260-860.000.

Sakurada, Hikaru: *See—*
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Sakurai, Yasusada: *See—*
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Sakurai, Yoshitoshi: *See—*
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Salakari, Martti. Device for preventing the skidding of wheels and similar objects. 3,884,284, Cl. 152-210.000.

Sami, Mohammad Ajaz. Urinary collection device. 3,884,235, Cl. 128-295.000.

Samoilov, Sergei Mikhailovich; Monastyrsky, Viktor Nikolaevich; Pudovik, Svetlana Tikhonovna; and Kuznetsov, Evgeny Vasilievich. Method for preparing branched copolymers by ethylene with unsaturated silicone monomers. 3,884,891, Cl. 260-88.10R.

Sander, Bruno: *See—*
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Sanders, Carl D. Puzzle table. 3,884,476, Cl. 273-157.00R.

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Sanyo Electric Company, Ltd.: *See—*
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Sargeant, Ralph G. Apparatus for agglomerating and/or drying and sterilizing particulate material. 3,885,119, Cl. 219-10.810.

Sartori, Rolland, to Rhone-Poulenc-Textile. Apparatus for use in winding pneumatically advanced yarns. 3,884,425, Cl. 242-18.00R.

Sasaki, Shosaku: *See—*
Koda, Yoshinobu; Sasaki, Shosaku; and Koda, Yoshiyuki, 3,884,950.

Sato, Akira: *See—*
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Sato, Masanori: *See—*
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Sato, Mitsunori, to Japan Exlan Company Limited. Method for producing acrylic synthetic fibers. 3,885,013, Cl. 264-182.000.

Saullo, James W.; Fehlman, William L.; and Grosser, Harry W. Decorative ribbon shredder. 3,883,953, Cl. 30-304.000.

Schachner, Herbert; Tannenberger, Helmut; and Baumberger, Bastian O., to Battelle Memorial Institute. Process for protecting a metallic surface against corrosion and wear. 3,885,063, Cl. 427-226.000.

Schaefer, Edward J., to Franklin Electric Co., Inc. Apparatus for locking end bells to a shell of an electric motor. 3,884,385, Cl. 220-309.000.

Schaeren, Sidney Frank, to Hoffmann-LaRoche Inc. Phenenthrene salts of α,γ-dihydroxy-β-β,dimethylbutyric acid. 3,884,966, Cl. 260-501.100.

Schat, Bralt Renze; and Timmermans, Abraham, to U.S. Philips Corporation. High-pressure discharge lamp. 3,885,184, Cl. 313-220.000.

Schaub, Robert Eugene; and Weiss, Martin Joseph, to American Cyanamid Company. Novel prostaglandins. 3,884,969, Cl. 260-514.00D.

Schaufelberger, Roy Henry: *See—*
Domine, Joseph Dominic; and Schaufelberger, Roy Henry, 3,884,786.

Schelkmann, Wilhelm. Method of retreading tires. 3,884,740, Cl. 156-96.000.

Schell, John A.: *See—*
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Schetty, Rudolf; and Carlstrom, Borge Ingmar, to Basler Stuckfarbere AG. Fiber-reinforced flexible plastic pipe. 3,884,269, Cl. 138-137.000.

Scheuerman, Ronald F.: *See—*
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Schick, Frederick A.; and Brown, Milton H., to Dura Corporation. Combination centering bearing and stop for car lift pistons. 3,884,128, Cl. 92-168.000.

Schlamann, Wilhelm; and Merz, Herbert, to Westinghouse Bremsen- und Apparatebau GmbH. Trailer brake cylinder pressure varied in accordance with variations of tractor brake cylinder pressure in response to tractor wheel slip. 3,884,529, Cl. 303-7.000.

Schlatter, Gerald Lance, to International Telephone and Telegraph Corporation. Densitometer. 3,885,140, Cl. 235-152.000.

Schlaudt, Charles M.: *See—*
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Schlegel (UK) Limited: *See—*
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Schlosser, Irvin L. Radiant space heater. 3,884,215, Cl. 126-91.00A.

Schlunke, Hans-Peter; and Egli, Christian, to Ciba-Geigy AG. 2,3 Substituted, 5,6 or 6,7 ethylene or methylene dioxy quinoxalines. 3,884,918, Cl. 260-250.00Q.

Schmidt, Alfred W.; and Freeman, Richard B. Fluid-powered crimping press. 3,883,938, Cl. 29-203.0DT.

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Schmidt, Hans Joachim; and Hartmann, Albert, to Metallgesellschaft Aktiengesellschaft. Crystallization of a fatty component from a feed by the steps of emulsification with a surfactant, cooling by vacuum evaporation and subsequent conventional separation. 3,884,046, Cl. 62-58.000.

Schmidt, Jacob E., to McGraw-Edison Company. Battery with post-strap insulative cap. 3,884,725, Cl. 136-134.00R.

Schmied, Rudolf: *See—*
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Schmitt, William H.: *See—*
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Schmutz, Jean; Hunziker, Fritz; and Kunzle, Franz Martin, to Sandoz-Wander, Inc. 11-Basically substituted dibenz [b,f] [1,4] oxazepines. 3,884,920, Cl. 260-268.0TR.

Schneider, Emanuel. Bidirectional drill transport. 3,884,309, Cl. 172-240.000.

Schneider, Hans-Georg; and Mikule, Jiri, to Pfeiffer and Langen. Process for making sugar from molasses by ion removal. 3,884,714, Cl. 127-46.00B.

Schneider, Marvin L., to Caterpillar Tractor Co. Air conditioning evaporator modular support and lowering means. 3,884,048, Cl. 62-298.000.

Schneider, Richard S., to Syva Company. Normorphine derivatives bonded to proteins. 3,884,898, Cl. 260-121.000.

Schnitzler, Alvin D., to United States of America, Army. Photodiode controlled electron velocity selector image tube. 3,885,187, Cl. 313-368.000.

Schoenborn, Benno P.; and Caspar, Donald L. D., to United States of America, Energy Research and Development Administration. Multilayer monochromator. 3,885,153, Cl. 250-251.000.

Schoenfelder, George A., to Motorola, Inc. X-T flexure piezoelectric device. 3,885,174, Cl. 310-9.500.

Scholl, Hans: *See—*
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Schott, Charles M., Jr.: *See—*
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Schott, Charles Mandeville, Jr.; and Schott, Charles Mandeville, Sr., to Schott, Charles M., Jr. Bag opening and emptying with traveling conveyor. 3,884,375, Cl. 214-305.000.

Schott, Charles Mandeville, Sr.: *See—*
Schott, Charles Mandeville, Jr.; and Schott, Charles Mandeville, Sr., 3,884,375.

Schottmiller, John C.; Ryan, Francis W.; and Wood, Charles, to Xerox Corporation. Photosensitive element employing a vitreous bismuth-selenium film. 3,884,688, Cl. 96-1.500.

Schrader, Gerhard; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. O-alkyl-s-[3-methyl-buten-(2)-yl]-(thiono)thiol-phosphoric-(phosphonic) acid esters. 3,884,999, Cl. 260-956.000.

Schraven, Willem, to Smit Nijmegen B.V. Tunnel furnace, and a method of operating same. 3,884,667, Cl. 65-119.000.

Schrenk, Walter J., to Dow Chemical Company, The. Apparatus for multilayer coextrusion of sheet or film. 3,884,606, Cl. 425-133.500.

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Schrotter, Wolfgang Adalbert, to Bunker Ramo Corporation. Switch-over contact. 3,885,115, Cl. 200-245.000.

Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See—*
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Schultz, Peter C.: *See—*
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Schultz, Ronald A.; and Tenney, Robert I., to Ozone Incorporated. Gas cooling and drying system for corona discharge ozone generating unit. 3,884,819, Cl. 250-533.000.

Schumacher, Berthold W., to Westinghouse Electric Corporation. Temperature control for an indirectly heated cathode for a high power electron beam gun. 3,885,194, Cl. 315-107.000.

Schumann, Fritz; Landwehrkamp, Hans; and Veit, Kurt, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Cleaning access and braking mechanism for open end spinning machines. 3,884,027, Cl. 57-56.000.

Schuster, Ernst, to L. & C. Steinmuller GmbH. Incinerator plant for pre-treated industrial wastes. 3,884,162, Cl. 110-8.00R.

Schwan, Wolfgang: *See—*
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Schwartz, James W. Towel apparatus. 3,884,630, Cl. 8-142.000.

Schwenninger, Ronald L., to PPG Industries, Inc. Method for coating continuously advancing substrate. 3,885,066, Cl. 427-314.000.

Sciaky, Albert M.; and Reynolds, Richard W., to Welding Research, Inc. Method and means for controlling adjacent arcs. 3,885,123, Cl. 219-123.000.

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Scoggins, Lacey E.; and Campbell, Robert W., to Phillips Petroleum Company. Arylene sulfide polymers. 3,884,884, Cl. 260-79.100.

Scott, Howard W.: *See—*
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Scott, Robert D., to Research Development Systems, Inc. Wearable, self-regenerating dialysis appliance. 3,884,808, Cl. 210-109.000.

Sedivy, Pierre: *See—*
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Seidehamel, Richard J.; and Dungan, Kendrick W., to Mead Johnson & Company. Ocular hypotensive process employing dextrorotatory phenethanolamines. 3,885,047, Cl. 424-330.000.

Seiler, Henry K., to du Pont de Nemours, E. I., and Company. Non-flocculated dispersions of perfluoroolefin polymer particles in organic liquid. 3,884,995, Cl. 260-900.000.

Seiscom Delta Inc.: *See—*
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Sejda, Henry J.: *See—*
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Sette, Paul R.; and Storace, Anthony, to Pitney-Bowes, Inc. Envelope moistening and sealing apparatus. 3,884,745, Cl. 156-441.500.

Sexstone, John H., to Brown & Williamson Tobacco Corp. Method and apparatus for the manufacture of filter rods containing particulate material by a split rod technique. 3,884,741, Cl. 156-259.000.

Seymour Foods, Inc.: *See—*
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Shaddock, Roland E., to Myers-Sherman Company. Unloading apparatus. 3,884,528, Cl. 302-58.000.

Sharp, James H.: *See—*
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Shekhtman, Isai Abramovich: *See—*
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Sheppard, Ronald J., to du Pont de Nemours, E. I., and Company. Acrylic coating composition for finishing flexible substrates. 3,884,852, Cl. 260-17.00R.
Shesternenkov, Viktor Ivanovich: *See—*
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Shores, Roger W., to Itek Corporation. Printing process including physical development of the printing plate image. 3,884,149, Cl. 101-450.000.
Short, James N., to Phillips Petroleum Company. Arylene sulfide polymer cured with the aid of certain compounds. 3,884,873, Cl. 260-45.85B.
Shulters, Robert B. Portable center drill. 3,884,592, Cl. 408-14.000.
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Slack, William Frederick, to Van Dyk Research Corporation. Xerographic fuser roller. 3,884,623, Cl. 432-60.000.
Slicer, Allan E.: *See—*
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Smith, Donald Paul; and Booth, Raymond E., to Smith, Donald P. Method of cooking food products. 3,885,056, Cl. 426-441.000.
Smith, Eric. Selected 3-trichloromethyl-5-substituted 1,2,4-thiadiazoles. 3,884,929, Cl. 260-302.0SD.
Smith, Kenneth: *See—*
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Smith, Robert J., to Planet Corporation. Control valve. 3,884,604, Cl. 418-270.000.
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Smith, William Ralph; and Deutsch, Herman, to Tele/Resources, Inc. Automatic branch exchange using time division switching. 3,885,103, Cl. 179-15.0AT.
Smith, William Ralph; and Deutsch, Herman, to Tele/Resources, Inc. Temporary memory for time division multiplex telephony system exchanges. 3,885,104, Cl. 179-15.0AT.
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Societe Suisse pour l'Industrie Horlogere Management Services, S.A.: *See—*
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Solomon, Arieh, to British and Foreign Tobacco Company, Ltd. Method of assembling and filling hinged containers. 3,884,013, Cl. 53-37.000.

Sommer, Alfred Hermann, to RCA Corporation. Method of making a multialkali electron emissive layer. 3,884,539, Cl. 316-6.000.

Sommer, Reinhold. Device for hitting a ball, shuttlecock or the like. 3,884,467, Cl. 273-73.00D.

Sonnenberg, Fred Max: *See—*
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Soto, Enrique. Machine for sizing and processing drapery material. 3,884,747, Cl. 156-467.000.

Soucek, Josef; Brazda, Zdenek; and Grecenko, Alexandr, to Vyzkumny ustav zemedelskych stroju. Working aggregate, more particularly for soil cultivation. 3,884,310, Cl. 172-292.000.

Southwestern Manufacturing Co.: *See—*
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Spaans, Johannes; and Onderwater, Adrianus, to Packard Becker BV. Liquid chromatography injection system. 3,884,802, Cl. 210-31.00C.

Spademan, Richard G. Overcenter ski binding mechanism. 3,884,492, Cl. 280-11.35R.

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Spivack, John J.; and Luzzi, John J., to Ciba-Geigy Corporation. Polyol esters of alkyl substituted hydroxy-benzoyloxybenzoic acids. 3,884,960, Cl. 260-473.00S.

SPOFA, United Pharmaceutical Works: *See—*
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Sprung, Ralph D., Jr. Liquid dispensing system. 3,884,183, Cl. 118-324.000.

Square D Company: *See—*
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Staar, Marcel Jules Helene. Transparency projector having a device to allow the playback of sound recordings. 3,884,566, Cl. 353-19.000.

Stabilator AB: *See—*
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Stack, Joseph S., to United States of America, Army. Double-base propellant containing an aromatic hydroxy compound. 3,884,736, Cl. 149-100.000.

Stahlecker, Fritz; and Stahlecker, Hans. Apparatus for removing impurities from fibers. 3,884,028, Cl. 57-56.000.

Stahlecker, Hans: *See—*
Stahlecker, Fritz; and Stahlecker, Hans, 3,884,028.

Stamicarbon B.V.,: *See—*
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Standard Brands Incorporated: *See—*
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Stanford Research Institute: *See—*
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Stang, Hans. Drying machine for textile fabric webs. 3,883,960, Cl. 34-153.000.

Stangl, Georg: *See—*
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Stanley, Robert K. Draw-crimping textile film strands. 3,883,936, Cl. 28-72.140.

Stapfer, Christian H.; and D'Andrea, Richard W., to Cincinnati Milacron Chemicals, Inc. Aldol condensation using cobalt II halide hydrazine complexes. 3,884,980, Cl. 260-586.00C.

Star Expansion Industries Corporation: *See—*
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Statham Instruments, Inc.: *See—*
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Staudt, Heinrich; Ritter, Ernst; Jaenke, Hans-Jurgen; and Muller, Rolf, to Robert Bosch G.m.b.H. Centrifugal RPM governor for fuel injected internal combustion engines. 3,884,205, Cl. 123-140.00R.

Stauffer Chemical Company: *See—*
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Steffen, Henry W. Speedometer cable lubricating device. 3,884,329, Cl. 184-1.00R.

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Kornis, Gabriel; Steinhards, Arnolds; Nidy, Eldon George; and Vostral, Henry J., 3,884,934.

Steinicke, Werner: *See—*
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Stenmark, Donald G.; and Heinrich, Raymond L., to Exxon Research and Engineering Company. Mixing apparatus and method. 3,884,451, Cl. 259-191.000.

Stephens, Derek James; MacFarlane, Eseni Gogo; and Turner, Owen James, to Cadbury Limited. Transfer apparatus. 3,884,343, Cl. 198-23.000.

Stern, Howard K.: *See—*
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Stern, Mark Charles, to American Telephone and Telegraph. Permanent signal lockout interface circuit. 3,885,107, Cl. 179-18.0FA.

Steward, David L.; and Tong, Wen-Hong, to Dow Chemical Company, The. Polycationic interferon inducer. 3,884,845, Cl. 260-2.0EN.

Steward, Joseph H., to Multifastener Corporation. Method of forming a nut. 3,883,915, Cl. 10-86.0CL.

Stidham, James Richard, to Bell Telephone Laboratories, Incorporated. Six-port conference amplifier circuit. 3,885,100, Cl. 179-1.0CN.

Stidolph, David L. Method and apparatus for packing, shipping and marketing of perishable products such as cut flowers. 3,883,990, Cl. 47-58.000.

Stockholm, John George: *See—*
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Stolkin, Walter J.; Riley, William A.; and Sejda, Henry J., to Stolmar Corporation. Apparatus for producing cartons. 3,884,130, Cl. 93-49.00R.

Stolmar Corporation: *See—*
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Strauff, Gunter, to Langen & Co. Hydraulic servo-steering system. 3,884,319, Cl. 180-79.20R.

Strebel, Siegfried: *See—*
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Striebich, Alfred: *See—*
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Strovas, Blaz, to Raymond Lee Organization, Inc., The, a part interest. Hide splitting and gutting device. 3,883,952, Cl. 30-299.000.

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Studdert, George M.: *See—*
Hatch, Donald M.; Studdert, George M.; Williamson, John B.; and Wycinowski, Roger W., 3,885,006.
Studer, Urs Peter, to Zumbach Electronic-Automatic. Measuring device. 3,884,076, Cl. 73-37.600.
Studiengesellschaft Kohle m.b.H.: *See—*
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Stuhr, Hans-Waldemar: *See—*
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Sudoh, Kengo; and Tsutsumi, Fumio, to Nippon Tsu Shin Kogyo K.K.; and TIE/Communications, Inc., part interest to each. Relay telephone dial pulse register. 3,885,109, Cl. 179-99.000.
Sugimizu, Masayuki, to Denki Onkyo Company, Limited. Pinch roller shifting mechanism for sequentially shifting a pinch roller in two substantially perpendicular directions toward a capstan. 3,884,407, Cl. 226-90.000.
Sugimoto, Minoru. Monorail structure. 3,884,153, Cl. 104-93.000.
Sugimoto, Yoshihiko: *See—*
Komatsu, Noboru; Arai, Tohru; Sugimoto, Yoshihiko; and Mizutani, Masayoshi, 3,885,059.
Komatsu, Noboru; Arai, Tohru; Sugimoto, Yoshihiko; and Mizutani, Masayoshi, 3,885,064.
Sugiyama, Hiroshi; and Numagami, Kiyoshi, to Nissan Motor Company Limited. Electric heat accumulator unit. 3,885,126, Cl. 219-365.000.
Sugiyama, Yunosuke, to Kabushiki Kaisha Sugiawa-Gen Iriki. Process for analyzing mercury. 3,884,639, Cl. 23-230.0PC.
Sujdak, Thomas, to Rockwell International Corporation. Loom warp beam device. 3,884,274, Cl. 139-97.000.
Sulco Basel AG: *See—*
Buchner, Stanislaw, 3,884,925.
Sulkowski, Theodore S., to American Home Products Corporation. A method of producing anorexia using imidazolinyl phenyl carbonyl compounds, their acid addition salts and related compounds. 3,885,037, Cl. 424-273.000.
Sulzer Brothers Ltd.: *See—*
Brenner, Wolfgang; Feier, Gunter; and Vinnemann, Antonius, 3,884,272.
Zerlauth, Ferdinand, 3,884,041.
Suman, George O., Jr.; Richardson, Edwin A.; and Scheuerman, Ronald F., to Shell Oil Company. Hydrated metal oxide deposition. 3,885,065, Cl. 427-230.000.
Summer, James R., to Round Rock Lime Company. Control of vertical heat treating vessels. 3,884,621, Cl. 432-19.000.
Summey, Betty Louise. Tampon and suppository combination. 3,884,233, Cl. 128-263.000.
Sumpter, Alray. Sleeping pillow with arm openings. 3,883,906, Cl. 5-338.000.
Sun Research and Development Company: *See—*
Hollstein, Elmer J., 3,884,936.
Sun-Sor GmbH: *See—*
Anetseder, Leopold, Sr.; and Anetseder, Leopold, Jr., 3,885,152.
Sun Ventures, Inc.: *See—*
Bushick, Ronald D.; and Hirschler, Alfred E., 3,884,986.
Sund-Borg Machines Corporation: *See—*
King, Earl H., 3,884,608.
Sundahl, Jimmy G.: *See—*
Fegraus, Clark E.; and Sundahl, Jimmy G., 3,884,297.
Sundt, Erling: *See—*
Dietrich, Paul; and Sundt, Erling, 3,884,247.
Sung, Eric; Umbach, Wilfried; and Baumann, Horst, to Henkel & Cie GmbH. Process for the production of alkylene glycol monoesters. 3,884,946, Cl. 260-400.000.
Superior Iron Works & Supply Company, Inc.: *See—*
Green, Lane A., 3,884,040.
Suschuk-Sljusarenko, Igor Ivanovich: *See—*
Dudko, Daniil Andreevich; Alexeenko, Alexei Pavlovich; Lychko, Ivan Ivanovich; Iljushenko, Valentin Mikhailovich; Suschuk-Sljusarenko, Igor Ivanovich; Tarnovsky, Alexandr Grigorievich; Kostevich, Dmitry Nikolaevich; Andrusenko, Jury Iosifovich; Gurevich, Samuil Markovich; and Strakhov, Gennady Nikolaevich, 3,885,121.
Suverkrop, Don, to Hopper, Inc. Level luffing crane. 3,884,359, Cl. 212-35.000.
Suwa, Michiharu; Tajima, Akira; Shimazaki, Mamoru; and Hirata, Noritsugu, to Canon Kabushiki Kaisha. Optical system capable of extreme close up photography. 3,884,555, Cl. 350-187.000.
Suzuki, Kiitiro; and Hunakawa, Minoru. Apparatus for producing glass pellets. 3,884,668, Cl. 65-142.000.
Suzuki, Kohji: *See—*
Matsuo, Kazunori; Suzuki, Kohji; and Endo, Katutsohi, 3,884,824.
Suzuki, Masaru: *See—*
Nakao, Yoshio; Kuno, Mitsuzo; and Suzuki, Masaru, 3,884,759.
Suzuki, Shigeru: *See—*
Mochimaru, Hideaki; Suzuki, Shigeru; Ikezu, Yohei; Yaeshima, Masao; and Ukai, Takeshi, 3,884,576.
Suzuki, Tomokazu, to Tamura Electric Works, Ltd. Digital display apparatus. 3,883,968, Cl. 40-77.800.
Suzuki, Yuji: *See—*
Kosaka, Yujiro; Uemura, Masaru; Saito, Mitsutaka; Suzuki, Yuji; and Takamoto, Kunio, 3,884,991.
Svendsen, Lars-Gundro: *See—*
Blomback, Gustaf Erik Birger; Blomback, Margareta; Claeson, Karl Goran; and Svendsen, Lars-Gundro, 3,884,896.
Svenska Utvecklings AB (SUAB), Swedish National Development Co.: *See—*
Lind, Per Ingemar Arnold, 3,884,069.
Svintidze, Nadezhda Georgievna: *See—*
Gogorishvili, Platon Vladimirovich; Geleishvili, Tengiz Pavlovich; Zarkua, Nina Porfirievna; Nikolishvili, Georgy Alexeevich; Dundua, Rusudan Georgievna; Svintidze, Nadezhda Georgievna; Onuchkina, Nina Ivanovna; Kasradze, Gaioz Grigorievich; and Kuperman, Genrikh Moiseevich, 3,883,908.
Swallow, Albert J., Jr. Truck loading system. 3,884,374, Cl. 214-84.000.
Swanson, Robert R.: *See—*
Gallagher, Ronald V.; and Swanson, Robert R., 3,884,347.
Sweeney, William T.; and Harris, Gary R., to Continental Oil Company. Linkage connection for a hose hauling vehicle. 3,884,257, Cl. 137-355.160.
Sweet, David L.: *See—*
Sweet, Phillip J.; Hamlet, Buck C.; and Sweet, David L., 3,884,526.
Sweet, Phillip J.; Hamlet, Buck C.; and Sweet, David L., to American Carrier Equipment. Unit for converting flat-bed trucks to side-dump trucks. 3,884,526, Cl. 298-1.00A.
Swenson, Reuben A.: *See—*
Miller, James E.; and Swenson, Reuben A., 3,884,820.
Swimquip Division Weil-McLain Company, Inc.: *See—*
Rowley, William N.; and Kirish, Warand R., 3,884,440.
Swingline, Inc.: *See—*
Michaelis, Jack H.; and Malcik, Frank J., 3,884,586.
Symbolic Displays, Inc.: *See—*
Lang, William J.; Brewer, Gerald K.; Fritz, Richard B.; and Eggers, Frederick W., 3,885,226.
Syntex (U.S.A.) Inc.: *See—*
Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,885,038.
Systematics, Inc.: *See—*
Kuehn, Andrew, III, 3,884,207.
Syva Company: *See—*
Schneider, Richard S., 3,884,898.
Szczepanski, Harry. Automatic spray-painting machine. 3,884,179, Cl. 118-70.000.
Szekely, Denes: *See—*
Wack, Geza; Nagy, Lajos; Szekely, Denes; Szolnoky, Jozsef; Udvardy-Nagy, Eva; and Zsoka, Erzsebet, 3,884,762.
Szolnoky, Jozsef: *See—*
Wack, Geza; Nagy, Lajos; Szekely, Denes; Szolnoky, Jozsef; Udvardy-Nagy, Eva; and Zsoka, Erzsebet, 3,884,762.
Tachibana, Kooichi: *See—*
Shimada, Fumitaka; Ikekawa, Tetsuro; Endo, Tomio; Kuroda, Hideo; Ikeda, Yoshiaki; Tachibana, Kooichi; and Okazaki, Yoshimi, 3,884,911.
Tadanier, John Soloman: *See—*
Jones, Peter Hadley; Martin, Jerry Roy; McAlpine, James Bruce; Pauvlik, Jeanne Marie; and Tadanier, John Soloman, 3,884,903.
Tajima, Akira: *See—*
Suwa, Michiharu; Tajima, Akira; Shimazaki, Mamoru; and Hirata, Noritsugu, 3,884,555.
Tajima, Ikuo. Needle-bar and take-up lever selection apparatus for embroidery machine. 3,884,165, Cl. 112-83.000.
Takada, Toshihisa; and Matsui, Yukio, to Fujikura Cable Works, Ltd. Air tight dam for communication cables. 3,885,087, Cl. 174-93.000.
Takagi, Kunihiko: *See—*
Koshimo, Akio; Tomita, Kosuke; Takagi, Kunihiko; Mitsui, Minoru; and Isikawa, Kunihiro, 3,884,702.
Takahashi, Kanjiro, to Nihon Denshi Kabushiki Kaisha. Method and apparatus for detecting dangerous articles and/or precious metals. 3,884,816, Cl. 250-359.000.
Takahashi, Kenryu. Hydroplane boat. 3,884,172, Cl. 114-66.50R.
Takahashi, Susumu: *See—*
Ito, Ryosuke; and Takahashi, Susumu, 3,885,101.
Takamoto, Kunio: *See—*
Kosaka, Yujiro; Uemura, Masaru; Saito, Mitsutaka; Suzuki, Yuji; and Takamoto, Kunio, 3,884,991.
Takatoku, Kazue: *See—*
Kawabe, Ushio; Fukase, Shigeo; Ishibashi, Masato; Kudo, Mitsuhiro; and Takatoku, Kazue, 3,884,683.
Takawashi, Tamio: *See—*
Kobayashi, Kazuhiko; Takawashi, Tamio; and Arai, Shinji, 3,884,790.
Takeda Chemical Industries, Ltd.: *See—*
Nakao, Yoshio; Kuno, Mitsuzo; and Suzuki, Masaru, 3,884,759.
Takeda, Masashi: *See—*
Tsurushima, Katsuaki; Ota, Yoshio; and Takeda, Masashi, 3,885,099.
Takeuchi, Yasuhisa; and Iizuka, Haruhiko, to Nissan Motor Company Limited. Device for controlling the braking fluid pressure in the hydraulic brake system of motor vehicles. 3,884,531, Cl. 303-21.0BE.

Tamura Electric Works, Ltd.: *See—*
Suzuki, Tomokazu, 3,883,968.

Taner, M. Turhan: *See—*
Anstey, Nigel A.; and Taner, M. Turhan, 3,885,225.

Taniguchi, Masao; Kanai, Hiromi; and Yamazaki, Eiichi, to Hitachi, Ltd. Shadow mask having all surfaces metal-coated. 3,885,190, Cl. 313-402.000.

Taniguchi, Toshinori: *See—*
Yoshizawa, Toshio; Yamada, Yasuo; and Taniguchi, Toshinori, 3,884,026.

Tannenberger, Helmut: *See—*
Schachner, Herbert; Tannenberger, Helmut; and Baumberger, Bastian O., 3,885,063.

Tanno, Yuji, to ABE Engineering & Development Co. Ltd. Synchronizing device for picture-story show and cartridge tape player. 3,884,565, Cl. 353-15.000.

Tarao, Akira: *See—*
Ooya, Junichiro; Sakakibara, Naoji; Kawabata, Yasuhiro; Nawa, Hideo; Hida, Takashi; Tarao, Akira; Tsukuba, Korehiko; and Kuwana, Kazutaka, 3,885,137.

Tarbox, John W.; Hinds, Walter E.; Castro, Rodolfo; and Bell, Raymond C., to Hughes Aircraft Company. Strand detection arrangement. 3,885,161, Cl. 250-571.000.

Tarnovsky, Alexandr Grigorievich: *See—*
Dudko, Daniil Andreevich; Alexeenko, Alexei Pavlovich; Lychko, Ivan Ivanovich; Iljushenko, Valentin Mikhailovich; Suschuk-Sljusarenko, Igor Ivanovich; Tarnovsky, Alexandr Grigorievich; Kostevich, Dmitry Nikolaevich; Andrusenko, Jury Iosifovich; Gurevich, Samuil Markovich; and Strakhov, Gennady Nikolaevich, 3,885,121.

Taylor, Glenn N., to Colgate-Palmolive Company. Disposable diaper. 3,884,234, Cl. 128-287.000.

Taylor, Robert, to Distillers Company (Yeast) Limited, The. Preparation of active dry yeast. 3,885,049, Cl. 426-18.000.

Taylor, Vincent J., deceased; by Zellmer, Wayne G., executor; and Beasey, Earl E., to United States of America, Navy. Safe and arm device. 3,884,118, Cl. 89-1.814.

Technical Operations Incorporated: *See—*
Graser, Michael, Jr., 3,884,553.

Tee-Pak, Inc.: *See—*
Burke, N. I.; and Bridgeford, D. J., 3,884,908.
Cohly, Mauj A., 3,885,054.

Teijin Ltd.: *See—*
Hirose, Isao; Funabashi, Kazutoshi; Fujii, Takeshi; and Kawajiri, Kiyoshi, 3,884,984.

Telautograph Corporation: *See—*
Hauser, Frank W., 3,884,461.

Tele/Resources, Inc.: *See—*
Deutsch, Herman, 3,885,106.
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Smith, William Ralph; and Deutsch, Herman, 3,885,104.

Teleflex Incorporated: *See—*
Kehm, Paul H., 3,884,449.

Telic Corporation: *See—*
Penfold, Alan S.; and Thornton, John A., 3,884,793.

Tempress, Inc.: *See—*
Arima, Juichi; and Brink, Delbert L., 3,884,522.

Tenneco Chemicals, Inc.: *See—*
Ricciardi, Michael A.; Cordora, Michael L.; and Smudin, David, 3,884,848.

Tenney, Robert I.: *See—*
Schultz, Ronald A.; and Tenney, Robert I., 3,884,819.

Tepper, Harry W. Apparatus for correcting tongue thrust. 3,884,226, Cl. 128-136.000.

Terry, Peter Alfred; and Reynolds, Ronald. Key-actuated locks. 3,884,058, Cl. 70-355.000.

Tersch, Richard W., to Lear Siegler, Inc. Gear rolling. 3,884,063, Cl. 72-102.000.

Tesei, Renato: *See—*
Girotti, Pierleone; Tesei, Renato; and Floris, Telemaco, 3,884,988.

Tesker, Donald H.: *See—*
Grob, Theodore; and Tesker, Donald H., 3,884,196.

Tetra Pak Developement S.A.: *See—*
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Tetra Pak Developpement SA: *See—*
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Tetsuro Ikekawa: *See—*
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Texaco Inc.: *See—*
Barber, Everett M.; Brandenburg, John T.; and Frost, Richard A., 3,884,037.
Crouch, William B., 3,884,648.
Hess, Howard V.; Cole, Edward L.; and Franz, William F., 3,884,751.
Miller, Edward F.; and Hellmuth, Walter W., 3,884,821.

Texaco Trinidad, Inc.: *See—*
Turner, Eric B.; and Schell, John A., 3,884,301.

Texas Instruments Incorporated: *See—*
Alexander, Dale Bruce; and Johnstone, James Hayden, 3,883,937.
Bean, Kenneth Elwood, 3,884,733.

Thetford Corporation: *See—*
Vanden Broek, Christiaan J. H.; and Antos, John M., 3,883,903.

Thettu, Raghulinga R.; and White, William T., to Xerox Corporation. Cleaning roll apparatus having rejuvenated cleaning surface. 3,883,921, Cl. 15-256.520.

Thettu, Raghulinga R., to Xerox Corporation. Capillary baffle-constant oil height independent of oil level. 3,884,181, Cl. 118-261.000.

Thieme, Peter: *See—*
Koenig, Horst; Thieme, Peter; and Amann, August, 3,884,930.

Thingamajig Corporation: *See—*
MacDonald, Richard A.; MacDonald, James A.; and Andrews, Joseph J., 3,884,466.

Thoman, Daniel Laverne, to RCA Corporation. Hermetic seal and method. 3,884,007, Cl. 52-624.000.

Thomas & Betts Corporation: *See—*
Fortsch, William A., 3,883,929.

Thominet, Michel Leon, to Societe d'Etudes Scientifiques et Industrielles de L'Ile-de-France. Method of anesthetizing a mammal by administration of a substituted 2-arylalkyloxy benzamide. 3,885,033, Cl. 424-246.000.

Thompson, Larry Flack: *See—*
Heidenreich, Robert Darrow; and Thompson, Larry Flack, 3,885,076.

Thomsen, Paul M.: *See—*
Riviere, Donald L.; and Thomsen, Paul M., 3,884,287.

Thomson Industries, Inc.: *See—*
Thomson, John B., 3,884,365.

Thomson, John B., to Thomson Industries, Inc. Workpiece manipulator. 3,884,365, Cl. 214-1.0CM.

Thorn Electrical Industries Limited: *See—*
Vause, Arthur Samuel, 3,885,186.
Wolfe, Kenneth Roy; and Underwood, Clive Arthur Evander, 3,885,149.

Thorn, Herbert, to Ideal Toy Corporation. Doll with eye-closing means responding to lateral tilting and separate eye-closing means responding to rearward tilting. 3,883,986, Cl. 46-135.00R.

Thornton, John A.: *See—*
Penfold, Alan S.; and Thornton, John A., 3,884,793.

Threshold Technology Inc.: *See—*
Simmering, Lawrence R.; Martin, Thomas B.; and Herscher, Marvin B., 3,883,954.

Throner, Guy C., Jr.: *See—*
Fichter, Arthur A., Jr.; Danks, Ronald D.; Larsen, Farrell G.; and Throner, Guy C., Jr., 3,883,942.

TIE/Communications, Inc.: *See—*
Sudoh, Kengo; and Tsutsumi, Fumio, 3,885,109.

Tieri, Joseph C.: *See—*
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Tilley, Ralph E. Incandescent lamp. 3,885,185, Cl. 313-318.000.

Timmermans, Abraham: *See—*
Schat, Bralt Renze; and Timmermans, Abraham, 3,885,184.

Timmermans, Wilhelmus Jan, to R. J. Brown & Associates Corporation. Artificial island. 3,884,043, Cl. 61-72.300.

Tixier, Georges. Medicine comprising lysine by-products. 3,885,030, Cl. 424-180.000.

Toberman, Charles E. Expressway power generating system. 3,885,163, Cl. 290-1.000.

Tobin, Ronald D.: *See—*
Dunn, Charlton, III; Tobin, Ronald D.; Bergstreser, Neil E.; and Heinz, Theodore A., 3,884,558.

Tofpenets, Vitold Antonovich: *See—*
Chernov, Evgeny Alexandrovich; Poletaev, Arkady Nikolaevich; Golod, Saul Vulfovich; Petrov, Evgeny Vasilievich; Vasiliev, Dmitry Timofeevich; and Tofpenets, Vitold Antonovich, 3,884,122.

Tokaiwa, Kiyoshi: *See—*
Abe, Toshihiro; and Tokaiwa, Kiyoshi, 3,884,533.

Tokuno, Masateru, to Rengo Co., Ltd. Apparatus for piling boards. 3,884,345, Cl. 198-35.000.

Tokushima, Tadao, to Nippon Gakki Seizo Kabushiki Kaisha. Photoconductive waveform memory. 3,885,151, Cl. 250-211.00R.

Tokyo Juki Kobyo Kabushiki Kaisha: *See—*
Nakamura, Shirozi, 3,884,164.

Tomita, Chuji; Shimizu, Kouichi; Shima, Shizuo; and Ishizuka, Tatsuhiro, to Hitachi Medical Corporation. Film cassette for radiographic apparatus. 3,884,818, Cl. 250-480.000.

Tomita, Kosuke: *See—*
Koshimo, Akio; Tomita, Kosuke; Takagi, Kunihiko; Mitsui, Minoru; and Isikawa, Kunihiro, 3,884,702.

Tomlinson, Charles W., to Acme Visible Records, Inc. Method and apparatus for unloading and storing reels and the like. 3,884,369, Cl. 214-8.000.

Tong, Wen-Hong: *See—*
Steward, David L.; and Tong, Wen-Hong, 3,884,845.

Toray Silicone Company, Ltd.: *See—*
Koda, Yoshinobu; Sasaki, Shosaku; and Koda, Yoshiyuki, 3,884,950.

Torrington Company, The: *See—*
Bowen, Willard L., 3,884,406.

Townend, Gordon Howard, to GKN Group Services Ltd. Straightening elongated articles. 3,884,065, Cl. 72-299.000.

Townsend Engineering Company: *See—*
Townsend, Ray T., 3,885,053.

Townsend, Ray T., to Townsend Engineering Company. Method of forming a skin surface on an extruded meat emulsion. 3,885,053, Cl. 426-276.000.

Towry, Jack R., to Ralston Purina Company. Egg roll assembly machine. 3,884,136, Cl. 99-450.400.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Kosaka, Yujiro; Uemura, Masaru; Saito, Mitsutaka; Suzuki, Yuji; and Takamoto, Kunio, 3,884,991.
Otsuki, Susumu; Miyanohara, Isao; Mizui, Norimasa; and Kawamura, Hideo, 3,884,846.
Tramposch, Herbert; and Hubbard, David W., to Pitney-Bowes, Inc. Type disc and method of making same. 3,884,340, Cl. 197-53.000.
Traylor, Verlon L., to Union Oil Company of California. Process for separating low API gravity oil from water. 3,884,803, Cl. 210-44.000.
Treier, George: *See—*
Green, Charles J., Jr.; Treier, George; and MacClaren, Robert H., 3,884,685.
Triberti, Domenico: *See—*
Ballestra, Mario; and Triberti, Domenico, 3,884,643.
Trice, Robert T.; McLeod, Gordon D.; Anderson, Amos R.; and Wilson, Dennis C., to Phelps Dodge Industries, Inc. Coating compositions comprising polyimides and polysiloxanes. 3,884,868, Cl. 260-37.00N.
TRW Inc.: *See—*
Bernier, Robert V., 3,884,551.
Morris, James C., 3,885,122.
Tschek, Wolfgang: *See—*
Lohr, Alfred; Tschek, Wolfgang; Forster, Heinz; Klauk, Bernhard; and Schwan, Wolfgang, 3,884,135.
Tschesche, Harald; Fritz, Hans; and Christoph, Rudolf, to Bayer Aktiengesellschaft. New protease-inhibiting substance, its extraction, and its use. 3,885,012, Cl. 424-177.000.
Tschopp, Lloyd D.: *See—*
Woerner, Rudolph C.; Tschopp, Lloyd D.; and Oelze, Carl O., 3,884,650.
Tsukuba, Korehiko: *See—*
Ooya, Junichiro; Sakakibara, Naoji; Kawabata, Yasuhiro; Nawa, Hideo; Hida, Takashi; Tarao, Akira; Tsukuba, Korehiko; and Kuwana, Kazutaka, 3,885,137.
Tsunekawa, Tokuichi; and Uchiyama, Takashi, to Canon Kabushiki Kaisha. Automatic switching system for photometric portions. 3,884,584, Cl. 356-226.000.
Tsunoda, Teruo: *See—*
Oba, Yoichi; and Tsunoda, Teruo, 3,884,703.
Tsurushima, Katsuaki; Ota, Yoshio; and Takeda, Masashi, to Sony Corporation. Integrated logic circuit for the decoder of a multi-channel stereo apparatus. 3,885,099, Cl. 179-1.0GQ.
Tsutsumi, Fumio: *See—*
Sudoh, Kengo; and Tsutsumi, Fumio, 3,885,109.
Tucholski, Gary Ronald, to Union Carbide Corporation. Anode for galvanic cells. 3,884,721, Cl. 136-102.000.
Tucholski, Gary Ronald, to Union Carbide Corporation. Alkaline galvanic cells. 3,884,722, Cl. 136-102.000.
Tung, Stephen Yi-Sun: *See—*
Whitworth, Anthony J.; Tung, Stephen Yi-Sun; and Hajto, Ernest Anthony, 3,884,861.
Tunzini-Ameliorair: *See—*
de Crevoisier, Philippe; and Stockholm, John George, 3,884,654.
Turczanski, Henryk: *See—*
Hill, John; and Turczanski, Henryk, 3,883,949.
Turner, Eric B.; and Schell, John A., to Texaco Trinidad, Inc. Method of gravel-packing a high-pressure well. 3,884,301, Cl. 166-278.000.
Turner, Owen James: *See—*
Stephens, Derek James; MacFarlane, Eseni Gogo; and Turner, Owen James, 3,884,343.
Turtle, Quentin C.; Coia, Pasco A.; and Silva, John R., to General Signal Corporation. Force balance differential pressure transmitter. 3,884,079, Cl. 73-398.00R.
Tuschak, George; and Backhaus, Karl L., to Concast Incorporated. Articulated holder for pouring tube. 3,884,400, Cl. 222-533.000.
Tylius, Adolfo, to Alvic Development Corporation. Split-level townhouse. 3,884,001, Cl. 52-185.000.
Uchiyama, Masao; and Mori, Shoichiro, to Mitsubishi Petrochemical Company Limited. Production of dealkylated aromatic hydrocarbons and hydrogen. 3,884,987, Cl. 260-672.00R.
Uchiyama, Takashi: *See—*
Tsunekawa, Tokuichi; and Uchiyama, Takashi, 3,884,584.
Udvardy-Nagy, Eva: *See—*
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Ueki, Takehiro: *See—*
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Uemura, Masaru: *See—*
Kosaka, Yujiro; Uemura, Masaru; Saito, Mitsutaka; Suzuki, Yuji; and Takamoto, Kunio, 3,884,991.
Uhlyarik, Emanuel J. Conversion system for pedal-operated cycles. 3,884,484, Cl. 280-7.120.
Ukai, Takeshi: *See—*
Mochimaru, Hideaki; Suzuki, Shigeru; Ikezu, Yohei; Yaeshima, Masao; and Ukai, Takeshi, 3,884,576.
Ulmer, Jamie F. Rotary tool guard. 3,884,094, Cl. 74-609.000.
Umbach, Wilfried: *See—*
Sung, Eric; Umbach, Wilfried; and Baumann, Horst, 3,884,946.
Umeda, Yasuji: *See—*
Murata, Hikaru; Umeda, Yasuji; Sakurai, Yasusada; and Doi, Yasuo, 3,884,253.
Underwood, Clive Arthur Evander: *See—*
Wolfe, Kenneth Roy; and Underwood, Clive Arthur Evander, 3,885,149.
Unger, Dieter: *See—*
Rademacher, Friedrich; Quest, Karl; Knabe, Uwe; Unger, Dieter; Jordan, Heinz; Heckmann, Werner; and Plock, Karl, 3,884,277.
Uni Design Co. Ltd.: *See—*
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Union Carbide Corporation: *See—*
Breck, Donald W., 3,884,687.
Critchfield, Frank E.; and Koleske, Joseph V., 3,884,994.
Domine, Joseph Dominic; and Schaufelberger, Roy Henry, 3,884,786.
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Wilkins, Judd R.; and Mills, Stacey M., to United States of America, General Counsel-Code GP. Automatic microbial transfer device. 3,884,765, Cl. 195-127.000.

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Williams, Robert A. Fire extinguisher. 3,884,307, Cl. 169-59.000.

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Winkler, Rudolf, to Sandoz Ltd. Preparation and separation of 1,5- and 1,8-dihydroxyanthraquinone. 3,884,943, Cl. 260-383.000.

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Wise, Norman Dudley. Illuminated book holder. 3,884,538, Cl. 312-233.000.

Wise, Norman Dudley. Combination book enclosure and reading lamp. 3,885,145, Cl. 240-6.40B.

Wissmann, Hans: *See—*
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Witter, Evelyn Ruth. Bed patient turn and hold device. 3,884,225, Cl. 128-133.000.

Wittke, Ernest C.: *See—*
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Wittman, Arthur W. Foot actuated toilet device. 3,883,904, Cl. 4-249.000.

Wodka, Michael A.: *See—*
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Woerner, Rudolph C.; Tschopp, Lloyd D.; and Oelze, Carl O., to Petro-Tex Chemical Corporation. Waste disposal from oxidative dehydrogenation. 3,884,650, Cl. 55-54.000.

Wohlford, Larry H.: *See—*
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Wolf, Horst, to Zinser-Textilmaschinen Gesellschaft. Method of driving spindles of textile machines. 3,884,031, Cl. 57-156.000.

Wolfe, Kenneth Roy; and Underwood, Clive Arthur Evander, to Thorn Electrical Industries Limited. Lamp pinch seals. 3,885,149, Cl. 240-41.0BM.

Wolfson, Gerald; and Fehr, Eric R., to Hughes Aircraft Company. Combined head-up multisensor display. 3,885,095, Cl. 178-7.880.

Wood, Charles: *See—*
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Wood, Hamish Christopher Swan; and Stuart, Alexander, to University of Strathclyde, The. Butanone semicarbazone. 3,884,973, Cl. 260-554.000.

Wood, John R., to American Micro-Systems, Inc. Switch for electronic watch. 3,884,033, Cl. 58-23.00R.

Wood, Kenneth O.: *See—*
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Wosilait, Arnold A.: *See—*
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Wright, Charles H.; and Pastor, Gerald R., to United States of America, Interior. Solvent refined coal process with zones of increasing hydrogen pressure. 3,884,795, Cl. 208-8.000.

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Wright, Kenneth F. A. Dishwashing machine. 3,884,263, Cl. 137-571.000.

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Wulff, Goldwyn L. Flexible needle and guard device for a hypodermic syringe. 3,884,230, Cl. 128-221.000.

Wurm, Joseph Gerard; Van Impe, Jean; De Coninck, Antoine; Heylen, Paul Raymond; and Rombaux, Jean-Pierre, to Centre d'Etude de l Energie Nucleaire, C.E.N.; E.N.I.-Electrische Nijverheids-Installaties; and Belgonuclearie. Process for electro-chemically cutting an irradiated nuclear fuel assembly. 3,884,784, Cl. 204-129.750.

Wuttke, Klaus Guenther, to du Pont de Nemours, E. I., and Company. Button type galvanic cell. 3,884,723, Cl. 136-111.000.

Wycinowski, Roger W.: *See—*
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Yagi, Shizuo; Sakurai, Yoshitoshi; and Minowa, Isamu, to Honda Giken Kogyo Kabushiki Kaisha. Combustion chamber device for an internal combustion engine. 3,884,211, Cl. 123-191.00S.

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Yamada, Munesato; and Yoshida, Shuji, to Nippon Kogaku K.K. Device for making a pair of stereo-maps. 3,884,564, Cl. 353-6.000.

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Yoshizawa, Toshio; Yamada, Yasuo; and Taniguchi, Toshinori, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method and apparatus for effecting replacement of cans in spinning frame. 3,884,026, Cl. 57-34.00R.

Youkin, James R., to Edo-Aire Mitchell Industries, Inc. Directional gyro indicator system. 3,883,957, Cl. 33-318.000.

Young, Niels O.; and McCullough, John E., to Arthur D. Little, Inc. Scroll-type positive fluid displacement apparatus. 3,884,599, Cl. 418-55.000.

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Zaleski, John F., to Singer Company, The. Passive modulating component. 3,885,239, Cl. 343-7.600.

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Zeeh, Bernd; Jung, Johann; and Pander, Hans Joachim, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Plant growth regulators. 3,884,670, Cl. 71-76.000.

Zeewy, Abraham; and Geringer, Donald, to Cecil Equipment Co., Inc. Proportional control for guidance system. 3,883,956, Cl. 33-23.00K.

Zeiringer, Rudolf, to Hans List. Low-pressure measuring transformer. 3,884,078, Cl. 73-398.0AR.

Zellmer, Wayne G., executor: *See—*
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Zemanek, Rudolph; and Zemanek, Elena. Method and apparatus for calculating exponent characteristics. 3,885,133, Cl. 235-64.300.

Zerlauth, Ferdinand, to Sulzer Brothers Ltd. Gas turbine. 3,884,041, Cl. 60-657.000.

Zibritosky, George, to PPG Industries, Inc. Attachment of rigid members to frangible window panels. 3,885,072, Cl. 428-38.000.

Zigman, Cary Wayne. Invalid's portable step unit and attached carrying handle member therefor. 3,884,327, Cl. 182-113.000.
Zimmerman, Jerrel L., to A. E. Staley Manufacturing Company. Alkali-curable cationic/anionic starch for paper coating binders. 3,884,853, Cl. 260-17.300.
Zinser-Textilmaschinen Gesellschaft: *See*—
Wolf, Horst, 3,884,031.
Zipf, Frederick W., III: *See*—
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Zock, Joseph. Telephone dialing system. 3,885,108, Cl. 179-90.00B.
Zomeworks Corporation: *See*—
Baer, Stephen C., 3,884,414.
Zouck, Robert L., to AAI Corporation. Loading device for guns. 3,884,119, Cl. 89-45.000.
Zsoka, Erzsebet: *See*—
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Zverev, Anatoly Ivanovich; Pudzinsky, Mikhail Antonovich; Shesternenkov, Viktor Ivanovich; and Dudnik, Mikhail Pvalovich. Installation for explosive deposition of inorganic coatings. 3,884,415, Cl. 239-79.000.

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Dolby Laboratories, Inc.: *See*—
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MacKinney, Paul M., to Concrete Controls Corp. Moisture measuring and totalizing system. Re. 28,422, 5–20–75, Cl. 324—65.
McGillvary, Daniel R., to The Firestone Tire & Rubber Co. Elastomeric articles free from reinforcing elements. Re. 28,424, 5–20–75, Cl. 152—330.
Menge, Donald C., to Troy Steel Corp. Reinforcing gusset plate. Re. 28,427, 5–20–75, Cl. 85—13.
Monroe Auto Equipment Co.: *See*—
Higginbotham, William W. Re. 28,423.
Priaroggia, Paolo G., and A. Ferrentino, to Industrie Pirelli Societa Per Azion. Oil filled electric submarine cable with oil duct. Re. 28,425, 5–20–75, Cl. 174—15.
Rouse, David M., to Bell Telephone Laboratories, Inc. Memory coding technique. Re. 28,421, 5–20–75, Cl. 235—153.
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Boll, Herschel L.: *See*—
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Franklin John L., to Herschel L. Boll, Raspberry plant. 3,720. Cl. 46.
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Murison, Peter J., to Mikkelsens Inc., Poinsettia plant. 3,721. Cl. 86.

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American Optical Corp.: *See*—
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Andrews, Warren L., to Wells Lamont Corp. Glove. 235,118, 5–20–75, Cl. D2—276.
Armstrong, William M., to Lektra Lighting, Inc. Light track supporting clip. 235,133, 5–20–75, Cl. D8—259.
Ball, Robert F., to Country Store Products, Inc. Candle holder. 235,159, 5–20–75, Cl. D48—2.
Baylor, Bonnie H., Toy play vehicle. 235,156, 5–20–75, Cl. D34—15.
Beverage, John H., to American Optical Corp. Ophthalmic instrument arm. 235,162, 5–20–75, Cl. D57—1.
Binzer, Thomas J., and C. H. Schmitt, to General Electric Co. Portable microwave oven or similar article. 235,126, 5–20–75, Cl. D7—128.
Blessing, Rudolf W., to Blessing-Werke KG. Clock housing. 235,138, 5–20–75, Cl.D1—23.
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Boyer, Gerald E., and D. L. Koch, to Boyer Industries, Inc. Pump housing. 235,168, 5–20–75, Cl. D65—1.
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Echterling, Eugene J., to Questor Corp. Toy block. 235,157, 5–20–75, Cl. D34—15.
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Fernandez, Marzio F., to The Toro Company. Water sprinkler Control. 235,145, 5–20–75, Cl. D23—38.
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Helm, Dorsey L. Hand held pick-up implement. 235,130, 5–20–75, Cl. D8—51.
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Perkins, Peter J. Mini-basket. 235,155, 5–20–75, Cl. D34—5.
Poisson, Norman D., to The Gillette Co. Razor blade dispenser. 235,135, 5–20–75, Cl. D9—224.
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Sansoni, Eraldo. Gameboard. 235,154, 5–20–75, Cl. D34—5.
Sartore, James J. A. Multi-purpose clamp for holding within its tubular elements pencils, wires or similar articles. 235,-134, 5–20–75, Cl. D8—259.
Schlachter, Ruth C. Pot cover holder hook or the like. 235,125, 5–20–75, Cl. D7—129.
Schmitt, Charles H.: *See*—
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Shindler, Anthony, to American Optical Corp. Spectacle front. 235,163, 5–20–75, Cl. D57—1.
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261R 3,883,934

CLASS 26
55R 3,883,935

CLASS 28
72.14 3,883,936

CLASS 29
25.42 3,883,937
191.4 3,884,646
203DS 3,883,939
203DT 3,883,938
243.58 3,883,940
259 3,883,941
413 3,883,943
446 3,883,942
460 3,883,944
577 3,883,948
578 3,883,947
622 3,883,949

CLASS 30
106 3,883,950
226 3,883,951
299 3,883,952
304 3,883,953

CLASS 32
19 3,883,954

CLASS 33
12 3,883,955
23K 3,883,956
318 3,883,957

CLASS 34
5 3,883,958
48 3,883,959
153 3,883,960

CLASS 35
10.4 3,883,961
22R 3,883,962

CLASS 36
2.5AL 3,883,964
2.5AN 3,883,963

CLASS 37
42R 3,883,965

CLASS 40
36 3,883,966
65 3,883,967
77.8 3,883,968
106.52 3,883,969
110 3,883,970
119 3,883,971
128 3,883,972
142 3,883,973
152 3,883,974
155 3,883,975

CLASS 42
49R 3,883,976
75B 3,883,977

CLASS 43
22 3,883,978
42.09 3,883,979
43.12 3,883,981
69 3,883,980

CLASS 44
72 3,884,647

CLASS 46
1F 3,883,982
17 3,883,983
22 3,883,984
60 3,883,985
135R 3,883,986
202 3,883,987
239 3,883,988

CLASS 47
37 3,883,989
58 3,883,990

CLASS 48
197R 3,884,648
202 3,884,649

CLASS 49
70 3,883,991
362 3,883,992
490 3,883,993

CLASS 51
34C 3,883,994
91BS 3,883,995
206R 3,883,996
316 3,883,997
376 3,883,998

CLASS 52
90 3,883,999
127 3,884,000
185 3,884,001
212 3,884,003
285 3,884,002
309 3,884,004
585 3,884,005
617 3,884,006
624 3,884,007
699 3,884,008
741 3,884,009

CLASS 53
3 3,884,010
21 3,884,011
22A 3,884,012
37 3,884,013
55 3,884,014
131 3,884,015
182 3,884,016
296 3,884,017

CLASS 55
54 3,884,650
62 3,884,661
86 3,884,651
88 3,884,652
223 3,884,653
225 3,884,654
257 3,884,656
276 3,884,655
293 3,884,657
315 3,884,658
379 3,884,659
396 3,884,660
484 3,884,662

CLASS 56
9 3,884,018
12.7 3,884,019
320.2 3,884,020
346 3,884,021
364 3,884,022
400.1 3,884,023

CLASS 57
34AT 3,884,024
3,884,025
34R 3,884,026
56 3,884,027
3,884,028
58.91 3,884,029
140R 3,884,030
156 3,884,031

CLASS 58
23A 3,884,032
23R 3,884,033
28A 3,884,034
39.5 3,884,035

CLASS 60
39.18B 3,884,036
292 3,884,037
431 3,884,038
445 3,884,039
593 3,884,040
657 3,884,041

CLASS 61
5 3,884,042
72.3 3,884,043

CLASS 62
9 3,884,044
3,884,045
58 3,884,046
77 3,884,047
222 3,884,663
296 3,884,664
298 3,884,048

CLASS 64
14 3,884,049
19 3,884,050
23.7 3,884,051

CLASS 65
99A 3,884,665
110 3,884,666
119 3,884,667
142 3,884,668
343 3,884,669

CLASS 66
187 3,884,052
192 3,884,053
193 3,884,054

CLASS 70
58 3,884,055
100 3,884,056
259 3,884,057
355 3,884,058
456R 3,884,059

CLASS 71
76 3,884,670
88 3,884,671
93 3,884,672
106 3,884,673
113 3,884,674

CLASS 72
23 3,884,060
38 3,884,061
60 3,884,062
102 3,884,063
245 3,884,064
299 3,884,065
343 3,884,066

CLASS 73
37.6 3,884,076
49.8 3,884,070
73 3,884,067
88.5R 3,884,068
151 3,884,071
194C 3,884,069
215 3,884,072
233 3,884,073
290V 3,884,074
355EM 3,884,075
388R 3,884,077
398AR 3,884,078
398R 3,884,079
399 3,884,080
421.5R 3,884,081
422TC 3,884,082
432PS 3,884,083
432R 3,884,084
517R 3,884,085
558 3,884,086

CLASS 74
63 3,884,087
84 3,884,088
217C 3,884,089
424.8C 3,884,090
499 3,884,091
558 3,884,092
572 3,884,093
609 3,884,094
687 3,884,095
715 3,884,096
740 3,884,097
801 3,884,098

CLASS 75
.5BC 3,884,676
1 3,884,675
42 3,884,677
52 3,884,678
53 3,884,679
72 3,884,680
108 3,883,908
109 3,884,682
174 3,884,683

CLASS 81
367 3,884,100

CLASS 83
155 3,884,102
156 3,884,103
171 3,884,104
419 3,884,105
453 3,884,106
534 3,884,107
544 3,884,101

CLASS 84
1.24 3,884,108
275 3,884,109
471 3,884,110
3,884,111
3,884,112
3,884,113
3,884,114
3,884,115

CLASS 85
1C 3,884,116
13 Re.28,427
47 3,884,117
75 3,884,099

CLASS 89
1.814 3,884,118
45 3,884,119

CLASS 90
11A 3,884,120
13.05 3,884,121
58C 3,884,122

CLASS 91
447 3,884,123
487 3,884,124

CLASS 92
13.5 3,884,125
13.7 3,884,126
151 3,884,127
168 3,884,128

CLASS 93
8R 3,884,129
49M 3,884,131
49R 3,884,130
59MT 3,884,132

CLASS 96
1LY 3,884,684
1.4 3,884,685
3,884,686
3,884,687
1.5 3,884,688
3,884,689
3,884,690
1.6 3,884,691
15 3,884,693
30 3,884,694
3,884,695
35 3,884,696
48R 3,884,697
84R 3,884,698
85 3,884,692
87A 3,884,699
100 3,884,700
114.8 3,884,701
115P 3,884,702
115R 3,884,703

CLASS 98
33R 3,884,133
64 3,884,134

CLASS 99
348 3,884,135
450.4 3,884,136
625 3,884,137

CLASS 100
5 3,884,138
26 3,884,139
163R 3,884,140
3,884,141
214 3,884,142

CLASS 101
37 3,884,143
99 3,884,144
169 3,884,145
183 3,884,146
415.1 3,884,147
426 3,884,148
450 3,884,149

CLASS 102
16 3,884,150
19.2 3,884,151

CLASS 104
25 3,884,152
93 3,884,153
148MS 3,884,154

CLASS 105
4R 3,884,155
75 3,884,156
199R 3,884,157
368B 3,884,158

CLASS 106
1 3,884,704
3,884,705
15R 3,884,706
24 3,884,707
38.6 3,884,708
65 3,884,709
89 3,884,710
271 3,884,711
285 3,884,712
308N 3,884,713

CLASS 108
112 3,884,159
113 3,884,160

CLASS 110
8A 3,884,161
8R 3,884,162
10 3,884,163

CLASS 112
70 3,884,164
83 3,884,165
121.29 3,884,166
3,884,167
265 3,884,168
420 3,884,169

CLASS 114
20R 3,884,170
62 3,884,171
66.5R 3,884,172
235F 3,884,173

CLASS 115
17 3,884,174
24.3 3,884,175
49 3,884,176

CLASS 118
2 3,884,177
49 3,884,178
70 3,884,179
122 3,884,180
261 3,884,181
308 3,884,182
324 3,884,183
630 3,884,184
637 3,884,185

CLASS 119
3 3,884,186
14.14 3,884,187
20 3,884,188
51.13 3,884,189
109 3,884,190
158 3,884,191
159 3,884,192

CLASS 122
4D 3,884,193
7R 3,884,194

CLASS 123
8.41 3,884,196
32EA 3,884,195
75B 3,884,197
90.18 3,884,198
90.61 3,884,199
118 3,884,203
119A 3,884,200
119B 3,884,201
122AB 3,884,202
136 3,884,204
140R 3,884,205
3,884,206
148E 3,884,208
148R 3,884,207
188GC 3,884,210
188M 3,884,209
191S 3,884,211

CLASS 125
21 3,884,212

CLASS 126
21A 3,884,213
25B 3,884,214
91A 3,884,215
204 3,884,216
270 3,884,217

CLASS 127
46B 3,884,714

CLASS 128
1C 3,884,218
2A 3,884,220
2R 3,884,219
2.06V 3,884,221
11 3,884,222
63 3,884,224
133 3,884,225
136 3,884,226
140N 3,884,223
146.2 3,884,227
214F 3,884,228

218N 3,884,229
221 3,884,230
235 3,884,231
260 3,884,232
263 3,884,233
287 3,884,234
295 3,884,235
303.1 3,884,236
303.14 3,884,237
304 3,884,239
305 3,884,238
325 3,884,240
3,884,241
351 3,884,242
419P 3,884,243
476 3,884,244

CLASS 131

2 3,884,245
10.1 3,884,246
17R 3,884,247

CLASS 132

53 3,884,248

CLASS 134

2 3,884,249
88 3,884,250

CLASS 136

6F 3,884,715
26 3,884,716
67 3,884,717
83R 3,884,718
90 3,884,719
100R 3,884,720
102 3,884,721
3,884,722
111 3,884,723
114 3,884,724
134R 3,884,725
203 3,884,726

CLASS 137

13 3,884,252
102 3,884,254
110 3,884,253
265 3,884,255
322 3,884,256
355.16 3,884,257
360 3,884,258
375 3,884,259
469 3,884,260
488 3,884,261
489 3,884,262
565 3,884,265
571 3,884,263
615 3,884,251
624.14 3,884,264
625.27 3,884,266
625.33 3,884,267
625.36 3,884,268

CLASS 138

137 3,884,269
177 3,884,270

CLASS 139

1R 3,884,271
59 3,884,272
71 3,884,273
97 3,884,274
123 3,884,275

CLASS 140

115 3,884,276

CLASS 141

59 3,884,277
67 3,884,278
156 3,884,279

CLASS 144

73 3,884,280
218 3,884,281

CLASS 145

50DA 3,884,282

CLASS 148

6.2 3,884,727
11.5A 3,884,729
11.5F 3,884,728
12.4 3,884,730
127 3,884,731
175 3,884,732
3,884,733

CLASS 149

6 3,884,734
11 3,884,735
100 3,884,736

CLASS 152

210 3,884,284
213A 3,884,283
330R Re.28,424
3,884,285
375 3,884,286

CLASS 156

63 3,884,737
73.1 3,884,738
96 3,884,739
3,884,740
259 3,884,741
268 3,884,742
304 3,884,743
351 3,884,744
441.5 3,884,745
466 3,884,746
467 3,884,747
494 3,884,748
501 3,884,749

CLASS 160

368G 3,884,287

CLASS 162

4 3,884,750
31 3,884,751
89 3,884,752
190 3,884,755
299 3,884,756
374 3,884,757

CLASS 164

4 3,884,288
66 3,884,289
82 3,884,290
312 3,884,291

CLASS 165

39 3,884,292
51 3,884,293
92 3,884,294
96 3,884,295
3,884,296
145 3,884,297

CLASS 166

.5 3,884,298
68 3,884,299
133 3,884,300
278 3,884,301
291 3,884,302
308 3,884,303

CLASS 169

16 3,884,304
37 3,884,305
59 3,884,306
3,884,307
62 3,884,308

CLASS 172

240 3,884,309
292 3,884,310

CLASS 173

57 3,884,311

CLASS 174

14R Re.28,425
28 3,885,083
35MS 3,885,084
36 3,885,085
42 3,885,086
93 3,885,087
102D 3,885,088

CLASS 175

372 3,884,312

CLASS 177

119 3,884,313

CLASS 178

5.1 3,885,089
6 3,885,091
6.6A 3,885,090
7.2 3,885,092
7.3DC 3,885,093
7.6 3,885,094
7.88 3,885,095
15 3,885,096
18 3,885,097
88 3,885,098

CLASS 179

1CN 3,885,100
1GQ 3,885,099
3,885,101
7R 3,885,102
15AT 3,885,103
3,885,104
15BA 3,885,105
18FA 3,885,107
18J 3,885,106
90B 3,885,108
99 3,885,109
100.3B 3,885,110
170.8 3,885,111

CLASS 180

5R Re.28,423
9.54 3,884,314
33B 3,884,316
34 3,884,317
65R 3,884,318
79.2C 3,884,320
79.2R 3,884,319
89R 3,884,321

CLASS 181

33K 3,884,322
41 3,884,323
114 3,884,324
139 3,884,325
155 3,884,326

CLASS 182

113 3,884,327
222 3,884,328

CLASS 184

1R 3,884,329

CLASS 188

18A 3,884,331
73.4 3,884,332
153R 3,884,333

CLASS 192

56R 3,884,334
113B 3,884,335
131R 3,884,336

CLASS 194

59 3,884,330
3,884,337

CLASS 195

1.8 3,884,758
28R 3,884,759
66B 3,884,760
68 3,884,761
81 3,884,762
96 3,884,763
103.5R 3,884,764
127 3,884,765

CLASS 197

49 3,884,338
53 3,884,339
3,884,340
133R 3,884,341
186R 3,884,342

CLASS 198

23 3,884,343
31AA 3,884,344
35 3,884,345
99 3,884,346
254 3,884,347

CLASS 200

61.44 3,885,112
82B 3,885,113
148R 3,885,114
153S 3,885,117
245 3,885,115
308 3,885,116

CLASS 202

173 3,884,766
174 3,884,767

CLASS 203

11 3,884,768
53 3,884,769
82 3,884,770

CLASS 204

12 3,884,771
23 3,884,772
49 3,884,773
55Y 3,884,774
59F 3,884,775
73R 3,884,776
84 3,884,777
3,884,778
92 3,884,779
95 3,884,780
98 3,884,781
108 3,884,782
113 3,884,681
129.35 3,884,783
129.75 3,884,784
158 3,884,785
159.14 3,884,786
192 3,884,787
3,884,788
224M 3,884,790
224R 3,884,789
268 3,884,791
290F 3,884,792
298 3,884,793

CLASS 206

44R 3,884,349
44.12 3,884,350
45.12 3,884,348
225 3,884,351
322 3,884,935
424 3,884,352
426 3,884,353
427 3,884,354
494 3,884,355
521 3,884,356

CLASS 208

8 3,884,794
3,884,795
3,884,796
89 3,884,797
111 3,884,798
139 3,884,799

CLASS 209

82 3,884,800

CLASS 210

23 3,884,801
31C 3,884,802
44 3,884,803
64 3,884,804
65 3,884,805
78 3,884,806
104 3,884,807
109 3,884,808
163 3,884,809
169 3,884,811
170 3,884,810
220 3,884,812
297 3,884,813
321 3,884,814
521 3,884,815

CLASS 211

13 3,884,357
148 3,884,358

CLASS 212

35 3,884,359

CLASS 213

75TC 3,884,360

CLASS 214

1BB 3,884,363
1BT 3,884,361
1CM 3,884,365
1Q 3,884,362
1R 3,884,364
6BA 3,884,366
6B 3,884,367
8 3,884,369
8.5D 3,884,368
11R 3,884,370
16.1BB 3,884,371
83.28 3,884,373
83.3 3,884,372
84 3,884,374
305 3,884,375
314 3,884,376
767 3,884,377
769 3,884,378

CLASS 215

221 3,884,379

CLASS 219

10.55F 3,885,118
10.81 3,885,119
73 3,885,120
3,885,121
98 3,885,122
123 3,885,123
288 3,885,124
298 3,885,125
365 3,885,126
367 3,885,127
462 3,885,128
553 3,885,129

CLASS 220

9F 3,884,380
23.6 3,884,381
72 3,884,383
94A 3,884,384
272 3,884,382
309 3,884,385

CLASS 221

7 3,884,386

CLASS 222

83 3,884,387
129.4 3,884,391
132 3,884,388
146HE 3,884,389
149 3,884,390
153 3,884,392
3,884,393
3,884,394
176 3,884,395
327 3,884,396
370 3,884,397
402.13 3,884,398
3,884,399
533 3,884,400
544 3,884,401

CLASS 223

37 3,884,402

CLASS 224

5V 3,884,403
42.1B 3,884,404

CLASS 225

102 3,884,405
103 3,884,406

CLASS 226

90 3,884,407

CLASS 227

100 3,884,408

CLASS 228

20 3,884,409
121 3,883,946
176 3,883,945

CLASS 229

16D 3,884,410
17G 3,884,411
69 3,884,412

CLASS 235

61.11D 3,885,130
61.11E 3,885,131
61.11R 3,885,132
64.3 3,885,133
92DM 3,885,134
98R 3,885,135
144ME 3,885,136
150.2 3,885,137
150.53 3,885,138
152 3,885,139
3,885,140
153AM Re.28,421
164 3,885,141
3,885,142
181 3,885,143

CLASS 236

15A 3,884,413
49 3,884,414

CLASS 239

79 3,884,415
97 3,884,416
102 3,884,417
428.5 3,884,418
526 3,884,419

CLASS 240

2R 3,885,144
6.4B 3,885,145
7.1R 3,885,146
9R 3,885,147
10.66 3,885,148
41BM 3,885,149
46.39 3,885,150

CLASS 241

176 3,884,420
230 3,884,421
279 3,884,422
282.1 3,884,423

CLASS 242

7.02 3,884,424
18R 3,884,425
43.1 3,884,426
56.2 3,884,427
118.3 3,884,428
159 3,884,429
199 3,884,430

CLASS 244

7A 3,884,431
15 3,884,432
42CC 3,884,433
53R 3,884,434
76J 3,884,435
122A 3,884,436

CLASS 246

63C 3,884,437

CLASS 248

59 3,884,438
96 3,884,439
146 3,884,440
205R 3,884,441
221 3,884,442
467 3,884,443

CLASS 249

112 3,884,444
205 3,884,445

CLASS 250

211R 3,885,151
235 3,885,152
251 3,885,153
267 3,885,154
283 3,885,155
303 3,885,156
311 3,885,157
359 3,884,816
385 3,884,817
440 3,885,158
472 3,885,159
480 3,884,818
499 3,885,160
533 3,884,819
571 3,885,161
573 3,885,162

CLASS 251

61.4 3,884,446
144 3,884,447
149.9 3,884,448
294 3,884,449

CLASS 252

41 3,884,820
51.5A 3,884,822
51.5R 3,884,821
62.1 3,884,825
62.63 3,884,823
106 3,884,826
164 3,884,824
305 3,884,828
331 3,884,829
421 3,884,830
429C 3,884,832
429R 3,884,831
431N 3,884,833
439 3,884,834
451 3,884,835
455R 3,884,836
462 3,884,837
470 3,884,838
478 3,884,839
511 3,884,840
522 3,884,841
3,884,842
3,884,843

CLASS 254

164 3,884,450

CLASS 259

191 3,884,451
192 3,884,452

CLASS 260

2EN 3,884,845
2.2R 3,884,846
2.3 3,884,850
3,884,856
2.5AH 3,884,847
2.5BB 3,884,849
2.5BD 3,884,848
2.5N 3,884,844
3.3 3,884,851
17R 3,884,852
17.3 3,884,853
22CA 3,884,854
23EP 3,884,855
28.5AV 3,884,857
29.15B 3,884,858
29.2M 3,884,860
29.3 3,884,859
3,884,861
3,884,862
29.6S 3,884,863
29.7NR 3,884,864
31.8R 3,884,865
32.8SB 3,884,866
37AL 3,884,867
37N 3,884,868
38 3,884,869
40R 3,884,870
42.14 3,884,871
45.75W 3,884,872
45.85B 3,884,873
3,884,874
46.5E 3,884,875
47UA 3,884,877
47C 3,884,876
77.5AM 3,884,880
78R 3,884,881
78.4D 3,884,882
79.1 3,884,883
3,884,884
79.3R 3,884,885
80PS 3,884,886
80.75 3,884,887
80.78 3,884,888
83.7 3,884,889
87.5C 3,884,890
88.1R 3,884,891
91.3PV 3,884,892
93.1 3,884,893
93.7 3,884,894
94.2R 3,884,895
112.5 3,884,896
112.7 3,884,897
121 3,884,898
146R 3,884,899
162 3,884,900
207 3,884,901
210E 3,884,902
3,884,903
3,884,904
210.5 3,884,905
211R 3,884,906
212 3,884,907
218 3,884,908
233.3R 3,884,909
240F 3,884 912
240G 3,884,910
3,884,913
240J 3,884,911
243C 3,884,914
3,884,915
247.7G 3,884,916
248NS 3,884,917
250Q 3,884,918
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U.S. DEPARTMENT OF COMMERCE
Rogers C. B. Morton, *Secretary*

PATENT AND TRADEMARK OFFICE
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